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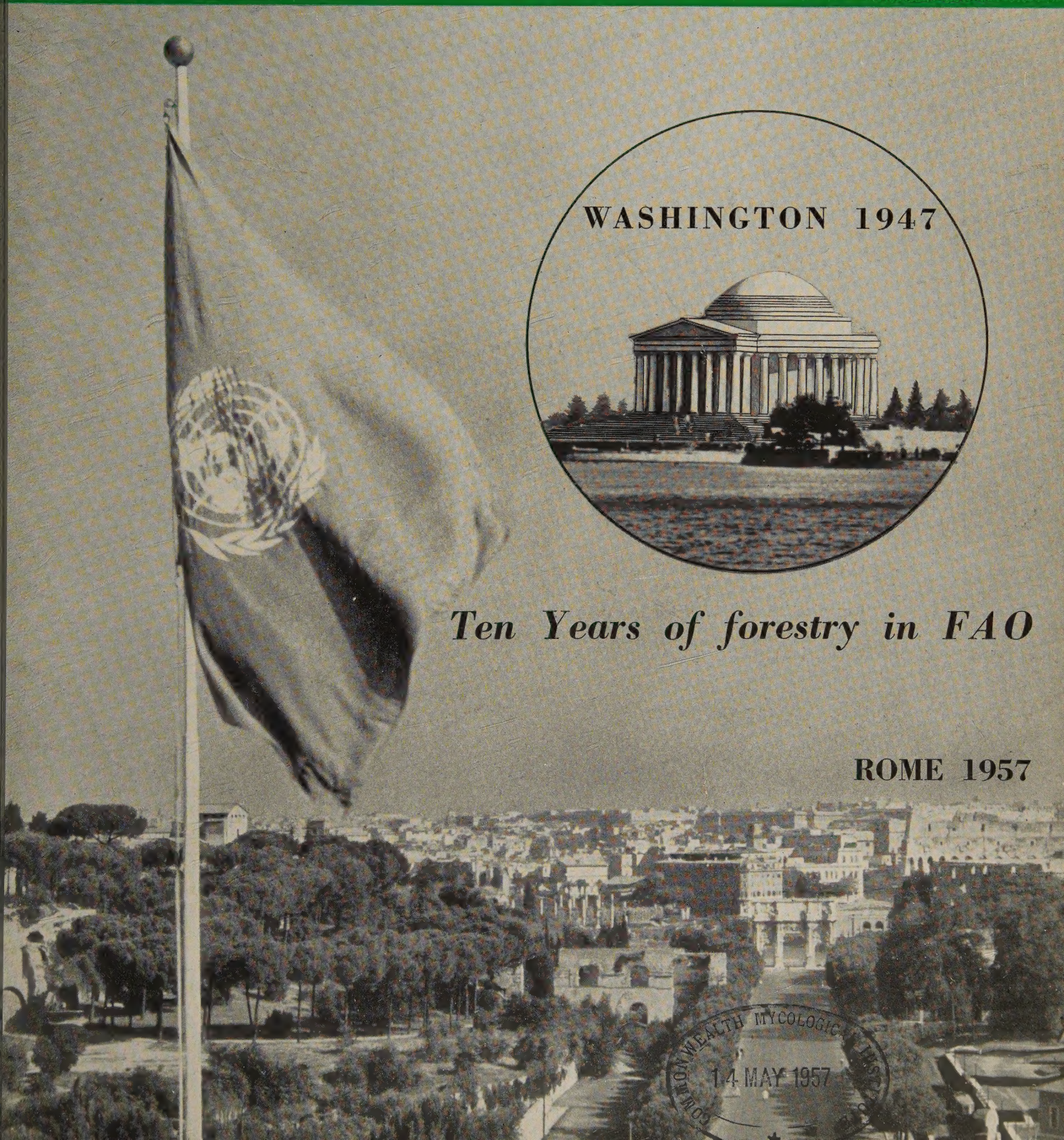

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Marcel Leloup
Director, Forestry Division

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PREPARED by the Forestry Division and published every quarter in English, French and Spanish, by the Information Division at FAO's Headquarters in Rome, ***Unasylva*** attempts to cover a range of interest as wide as that of FAO's Forestry Division whose work it mirrors. Signed articles express the opinions of the authors and do not necessarily represent the views of the Organization. All material in ***Unasylva*** may be freely reprinted, but acknowledgement is requested, together with a copy of the publication containing the reprint.

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Cover Photograph: *FAO was born at a conference called by President Roosevelt at Hot Springs, Virginia, U.S.A., in 1943. The Organization came formally into existence at Quebec in 1945. The Forestry Division was first located at 1710 New Hampshire Avenue, Washington D.C., and later moved to the Longfellow Building on Connecticut Avenue. When it was decided that the permanent Headquarters of FAO should be in Rome, the Forestry Division emigrated en masse by ship from New York to Naples, which was not the least adventurous of the Division's undertakings.*

Unasylva

An International Review of Forestry and Forest Products

ONE WORLD — ONE FOREST

"The name of FAO's new magazine, *Unasylva*, is well chosen — one world, one forest. This new review will attempt to shed light on all manner of problems in the field of forestry and forest products, to compare methods that are being used in different countries, and to present the opinions and suggestions of experts in the various fields. I hope and believe it will be a keen new blade in the world-wide battle for freedom from want."

These words are taken from an editorial by Sir John Boyd Orr, the first Director-General of FAO, which appeared in the first issue of *Unasylva* in 1947.

From the time of entering upon my duties as Director of the Forestry Division of the Food and Agriculture Organization of the United Nations, I had the intention of publishing a forestry periodical with a threefold purpose: to disseminate technical knowledge of world-wide or regional interest; to keep readers informed of the forestry activities of the Organization, and to be a connecting link between forest services to keep them informed of changes in the forest policies and the organization of the services of member countries.

It took a year to overcome the technical and administrative difficulties inherent in such an undertaking and it was in July 1947, when the provisional Headquarters of the Organization was at Washington, that the first number of *Unasylva* appeared.

When it was started there were many who doubted the wisdom of embarking on this project. But I always felt that a periodical like *Unasylva* had a real contribution to make and I think that my point of view has been amply proved during the ten years *Unasylva* has served the cause of forestry all over the world.

It seems now appropriate to celebrate the passage of these ten years by a special number devoted to taking stock of our activities.

To present a balance sheet of the activities of FAO in regard to forestry during this period is therefore our object here. The accomplishments are the work neither of one man nor of the few individuals who have become international civil servants. I have made the point from the beginning that the work of the Forestry Division is a collective work in which all the forest services and technicians of the world participate. It is in this spirit that I have organized the work of the Division, and that, in particular fields, a large number of experts have been associated with the activities of our technical groups.

For those who are not familiar with our work, this issue of *Unasylva* will give them an opportunity of learning about it and perhaps of realizing that it is not always accurate to say that international organizations have no value.

For the others, for all those who have been associated with the work of our regional commissions, technical groups, and meetings, it may bring pleasantly to mind some particular incident at a conference, some episode of a commission or congress, perhaps some forgotten friend.

I hope in this spirit that this number will interest you and that it will be appreciated. May it strengthen our friends in the view that there is still much to be done in the field of forestry, that the path is barely marked out, but that the future is full of promise and that we hope to see the young generation overcome the obstacles which we have only reconnoitred.

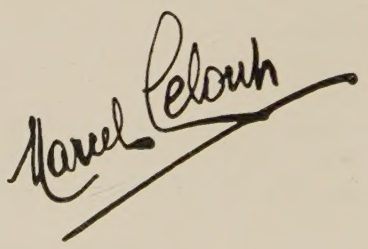


FIGURE 1. *To many people the classical concept of scientific forestry is embodied in the high forests of France. Typical high forest of oak with an understorey of beech. Forêt domainiale de Bercé (Sarthe) France.*

Photograph: Direction générale des eaux et forêts

FIGURE 2. *Cattle grazing in an old stand of larch. Forêt de Montgenèvre (Hautes Alpes) France*

Photograph: Direction générale des eaux et forêts

Ten Years of Forestry in FAO

Marcel Leloup
Director, Forestry Division

OBJECTIVES

To supply an expanding world economy with useful forest products, in the qualities and quantities adequate to sustain the general welfare: such, in very broad terms, was the objective that the Quebec Conference of 1945 laid down for FAO.

The field of work thus assigned to the Forestry Division is wide indeed. It not only includes the growing of timber, the production of which has to be increased without danger to the future of the forest, but it extends to all harvesting operations and to primary wood-processing industries; the development and improvement of appropriate equipment must keep pace with the increase in volume of the available raw material. It covers also the marketing and distribution of forest products, the development and improvement of manufacturing methods so that the consumer can get products derived from the forest and forest industries at a reasonable price, while both producers and workers get a just remuneration.

Besides this, among the basic values that man derives from the forest are the protection of his fields, the regulation of streamflow and control of floods. It is a chief means of controlling wind and water erosion. The forest serves to beautify the landscape and to provide healthy living conditions. These are considerations that must not be overlooked and which must even be given a primary place in FAO's outlook.

A very approximate appraisal of the world's existing forest resources and of the possibility of creating new ones — an appraisal that has been continually re-scrutinized from 1946 on — shows that the objective is not utopian. Nevertheless, although a large proportion of the land surface of the world is covered by forest, it is far from being as easy to attain as the abundance of resources might lead one to suppose.

The world's forests are, in fact, very irregularly distributed. The transport of wood from areas where it is abundant, which are generally sparsely populated and ill provided with means of communication, to thickly populated areas where it is most needed, is often an economically insoluble problem. The concentration of the population of the world at the most favored points, in terms of either climate or soil fertility, has sometimes promoted the development of intensive silviculture, but has more often led to the wholesale destruction of the forests in just those areas. The lack of forests has not only economic consequences. It leads also to soil degeneration and irregularity of the water regime. Despite the expanse of the areas still occupied by forests throughout the world, there is still need to create other new forests to replace those that have been lavishly destroyed.

Taking all facts into account, the Forestry Division soon realized that its general program of action had to be concentrated on four basic aims. These four aims were and continue to be:

a) *Increase in the yield from forests now being used* — Even in the most advanced forestry countries, it is admitted that such an increase is possible, either by applying sound forest management methods or by a wider use of techniques that research has improved, is now improving and will further improve in the future.

b) *Reduction of waste* — This means not only the waste occasioned by the primary conversion of wood but also the waste from logging operations, including trees and species abandoned because there is no economic use for them for the time being. In this field also considerable progress can be made.

c) *Opening up of virgin forests* — The bringing into use of forests hitherto inaccessible takes place almost automatically when, as in Canada or Russia, the forests will provide timber of high economic value, especially softwoods. It is a much more difficult proposition in tropical regions where there are extensive forests, because it entails being able to make effective use of the timbers that occur, then the setting up of industries capable of processing them, and often human colonization of the areas involved.

d) *Planting of new forests* — Apart from any economic considerations, the establishment or re-establishment of forests on areas dangerously subject to erosion is a sheer necessity. But locally for some communities, on the national level for many countries and regionally for some continents, as the studies carried out by the Division in the past ten years have shown, the planting of new forest is essential to meeting foreseeable increases in wood consumption.

The techniques to be used for increasing the yield of existing forests, reducing the volume of waste, opening up virgin forests or planting new forests, were already

Translated from an original French text.

FIGURE 3. *Rehabilitation of existing forests is an aim of FAO. General view of an old forest of cedars in the Atlas mountains of Morocco.*

Photograph: M. Laidet

well known ten years ago, even though they have since been refined and diversified. Nevertheless, great difficulties, not of a technical but of a political, economic or social character, very often prevent them from being applied. To take only the simplest examples, the opening up of virgin forests requires the investment of considerable capital which is often lacking in underdeveloped countries; the planting of new forests frequently clashes with competitive types of land-use, agriculture or pasture.

These difficulties can be overcome only by thinking out for each country, region and the world as a whole, a balanced development program, in which forests and forest industries will have their proper place. A forestry program, formulated within the framework of the general development program and co-ordinated with it, is simply the forest policy of the country, region or world. That is why the Forestry Division has, from the start, strongly urged the need for forest policies at each of these levels.

Apart from the non-technical complications just mentioned, the implementation of such forest policies and even their formulation faces other difficulties, because some forestry techniques are still insufficiently developed and some forestry problems far from being solved. In many cases, the non-forestry obstacles could be overcome if these techniques were improved and if more flexible or more adequate solutions to the problems were found.

In view of the goals to be achieved, the Forestry Division drew up a 15-point plan of action. Formulated in 1951, it still remains valid. The points, corresponding to the Division's fifteen lines of activity, can be summarized as follows:

1. *Forest policy*

Advising governments in drawing up and implementing national forest policies in keeping with the relative economic importance of forests in each country, a policy aiming at the conservation and proper utilization of forest resources and the rational development of the corresponding forest industries.

Co-ordinating national forest policies on the international level, through the action of FAO's Regional Forestry Commissions and ultimately the FAO Conference.

2. *Forest inventories*

Advising and assisting governments in planning and carrying out national forest inventories, so as to obtain more accurate and internationally comparable data.

Collecting the statistics thus obtained for the preparation and publication of regional and world estimates, to serve as a basis for the co-ordination of national forest policies on the international plane.

3. *Forest economics and statistics*

Working out standard estimates of the costs of forest enterprises and operations and assembling data so as to make it possible to compare different methods of conducting such enterprises economically and to calculate the prime cost of the various forest products.

Assembling, compiling and regularly disseminating statistics on forests and forest products with a view to providing governments with objective, comprehensive and up-to-date data. Improving national statistics by the introduction of more reliable assembling methods.

4. *Education*

Advising and assisting governments in creating public opinion alive to the importance of forests and forestry in the national economy.

Establishing the necessary facilities for the education of foresters and technicians and for the training of subordinate forestry personnel, and forest and industrial workers.

5. *Soil and water conservation*

Bringing about a general recognition of the essential function of forests and grasslands in streamflow regulation and in soil conservation.

Advising governments so that they can draw up rational policies of land use, particularly the use of forested and "wild" lands forming the greater part of catchment (watershed) areas.

6. *Conservation and improvement of forest ranges (grazing land)*

Advising and assisting governments to adopt sound policies for the utilization and conservation of the vast areas which, while serving as natural grazing lands for livestock, play a great but too often disregarded role in protecting farm land and regulating streamflow.

Close co-ordination of such policies with forest policy.

7. *Silviculture and forest management*

Advising and assisting governments in applying appropriate silvicultural methods to all forests playing a protective or productive role, or fulfilling other important functions.

Promoting forest research: studying and spreading techniques to assure an increase of growth in forests and improvement of the quality of forest products.

8. *Afforestation and reforestation*

Encouraging research work and assisting governments to ensure the extension of forests on bare or depleted land, in conformity with the aims defined in each case by the national forest policy.

Improving and spreading modern techniques for the establishing or restocking of forests by planting or seeding, adapted to the various conditions of soil and climate.

9. *Forest protection*

Assisting governments in devising administrative and technical methods to control fires, pests and diseases.

Encouraging the conclusion of international agreements to control the spread of these destructive forces.

10. *Equipment*

Promoting the introduction of useful modern equipment for the efficient and economic utilization of forest resources and the industrial processing of their products.

Assembling information from equipment manufactures, analysing and publishing it in appropriate forms. Encouraging manufacturers to produce machines and equipment that fully meet forestry requirements.

Improving the conditions of forest workers.

11. *Modernization and integration of forest industries*

Encouraging in all countries a gradual conversion of forest utilization into a suitably planned integration of forest industries with forest management; this entails forest management on a sustained-yield basis so that the forest can supply continuously an optimum group of industries with produce of specific qualities and in specific quantities.

Improving and modernizing existing industries to give increased yields from all phases of operations.

12. *Chemical utilization of wood*

Promoting research in the field of wood chemistry.

Advising and assisting governments in setting up new industries, in applying modern techniques and in generally improving the chemical utilization of forest products; often such utilization constitutes the only economic possibility of exploiting mixed forest stands or low grade timber and the residues from logging and mechanical processing operations.

FIGURE 4. *Efficient management of farm woodlands is another aim of FAO. A hardwood stand in Ontario, Canada, recently thinned.*

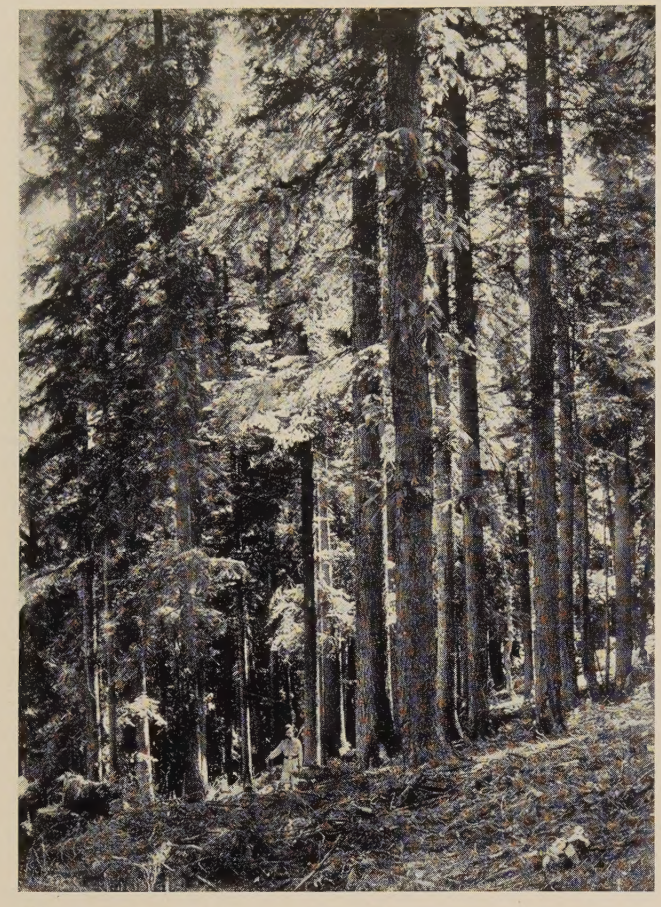


FIGURE 5. *A hill forest of silver fir in the Himalayas, India. During the war a great deal of this timber was used for airplane construction.*

Photograph: F.R.I., Dehra Dun

13. *Mechanical utilization and standardization*

Seeking a more rational mechanical utilization of timber.

Facilitating trade in forest products, particularly by the standardization of export contracts.

Endeavoring to bring about general agreement on standardization of terminology, measurement, sizes, grades and testing of industrial wood and primary forest products.

14. *Production and distribution policies*

Keeping a constant check on the current situation regarding the production of and trade in primary forest products and promoting action on the international level, to the extent possible, to adjust available supplies to demand.

15. *Stimulation of consumption*

Promoting action on the international and national plane to raise consumption of forest products to a level that will ensure for all peoples of the world adequate housing and an adequate standard of living.

Most of the activities outlined above are of concern to all countries and have world-wide implications. But the Forestry Division realized from the start the importance and indeed urgent necessity of adapting its actions to the particular needs of the different regions. There are of course differences in forest conditions from country to country and also within countries. Similarities of soils, climate and civilizations make it possible conveniently to divide the world into a number of regions within which comparable forest policies would be in order.

By suitably choosing the lines of activity to be emphasized in each region, one can hope to assist the region generally, as well as the countries that form part of it, not only to define or elaborate but also successfully to implement forest policy.

In Europe, the outstanding features of the forestry situation is that the continent has to meet the rapidly growing demand for timber with resources that are strictly limited and already relatively intensively exploited. Better organization and management of small forest holdings, which are widespread in this part of the world, the use of still more intensive methods of silviculture, the reduction of waste and the development of both internal and external trade should make it possible to cope with this situation.

The situation in North America is in some respects similar. This region, however, still possesses considerable untouched forest resources. On the other hand, expansion of the general economy is extremely rapid. Consequently, rational exploitation and the assured renewal of the resources should be the fundamental of the forest policy to be followed.

In the Near East and in North Africa, the establishing of new forests both to meet the demand for timber and to protect soil and water must be the main objective of forest policy. This objective is difficult of achievement owing both to the climate and to the social environment.

In Asia and the Far East, there is a marked imbalance between the forest production zones and the zones of population where the requirements for timber are concentrated. A large part of the forests pose problems that are common to many tropical areas, for instance lack of homogeneity and extensive practice of shifting cultivation.

Finally, in Latin America as in Africa, south of the Sahara, the most difficult problem, though it takes different forms in the two regions, is the opening-up and efficient exploitation of tropical virgin forests. There remains much progress to be made in tropical silviculture.

It was this variety of circumstances that has just been outlined, and the diversity of the methods to be used in meeting them, that determined for the Forestry Division the adoption of a regional approach to world forestry.

The means employed for this approach were and still are FAO's Regional Forestry Commissions, now existing for most regions (there are no Commissions for North

America, Africa and eastern Europe with northern Asia). They function at the policy level, while their subordinate committees, working parties and other organs work at the technical level.

FAO technical assistance missions are their projection at the national level.

The Conference of FAO co-ordinates action on the world level.

INVENTORIES AND STATISTICS

Forest Inventories

To formulate a forest policy, knowledge of the forest resource is essential. Data are provided by forest inventories which should yield information on the afforested area, ownership, composition of the stands, as well as estimates of the volumes of standing timber, annual growth, fellings and removals. In some countries, these data are contained in the various management plans, but especially in regard to countries where considerable areas of forest are under private ownership, it is very seldom that the aggregate data contained in such plans can constitute a true national inventory, even in respect to stands that are accessible or that may be earmarked for full utilization in the near future.

To obtain such national inventories, new methods are now available such as those devised in the Scandinavian countries, the Netherlands and North America, whereby inventories can be made for large forest areas on the basis of aerial photographs. These possibilities have so modified the problem of undertaking forest inventories that one may say that, with the possible exception of wood chemistry, no similar progress has been made in the last fifteen years in forestry science. In addition, these modern methods have reached a high degree of accuracy. The national inventories for Sweden, Finland, Norway and Great Britain are based on a combination of traditional methods and photogrammetry. Other countries which have begun or are undertaking national inventories based on such methods are the Netherlands, France, Italy, Thailand, Mexico (for a part of the country) and the Amazon basin in Brazil.

The Forestry Division set itself two tasks, namely, to keep abreast of new technical developments and to disseminate the results of experience made in the most advanced countries. A study entitled *Planning a National Forest Inventory* was published in 1950 in the interests of those who were to undertake a forest inventory on a large scale for the first time. A second edition is planned that will take into account the most recent technical advances. Articles in *Unasylva* dealing with particular aspects, have shown the progress achieved in some countries.

These technical advances have been made chiefly in the inventorying of coniferous forests in the Northern Hemisphere. Especially from the statistical standpoint, methods of interpretation cannot be applied automatically to tropical regions. New methods have often had to be devised in order to be able to carry out an inventory of tropical forests rapidly and inexpensively. Through the Expanded Technical Assistance Program, FAO has been able to send experts in forest inventorying to tropical countries, and it is encouraging to note that problems, already defined in regard to pure, even-aged conifer forests, can also be solved in regard to dense, mixed and uneven-aged stands. Satisfactory results have been obtained in forests of teak and dipterocarps as well as in the tropical virgin forests of the basin of the Amazon, where a specialist assisted by two young technicians has been able to conduct an inventory of two million hectares in two years.

The countries of the tropical and subtropical regions are becoming increasingly aware that they will be in a proper position to develop their forest resources only after carrying out a systematic inventory. The lack of technicians in this specialized field, however, is a serious hindrance to the progress that could be made. It is true that FAO has already made available to these countries a number of Fellowships to enable technicians to obtain a thorough knowledge of new methods abroad. This, however, is only a beginning, and steps are being taken to establish specialized courses for instruction: it is hoped, for example, to develop in Indonesia a first training center for forest inventories comprising courses lasting six months.

Statistics

The Forestry Division began its work at a time when the statistical services of many countries were disorganized, many statistics publications not having appeared for a number of years. The first task, therefore, was to assemble and present all the available data on the world forest situation in order to give a background to the great problems with which FAO would have to deal. A report summarizing this situation was submitted to the Copenhagen Conference of FAO in 1946, but this report clearly revealed that available statistics varied from country to country and were unsatisfactory as regards conception, scope, content and accuracy: nor were they sufficiently complete to be used for such important purposes as the formulation of forest policies or the recording of forest development trends.

The work of the Economics Branch of the Forestry Division was concentrated on two aspects of this problem: first, assembling, comparing, tabulating and interpreting available current statistics on forest production and forest products, in order to have on hand all the necessary data for analyzing the world situation and its trends; second, improving the statistical methods used in various countries, in order to increase their scope, accuracy, up-to-dateness and comparability from the

international standpoint. In practice, it is difficult to make a strict division between the two aspects of this work, and overlapping is inevitable.

One of the greatest obstacles to comparability of statistics was due to lack of clarity of the terms used. Inaccurate definitions, for example, of the terms " annual cut " and " annual increment " led to such large divergencies in the figures that the same data could serve as arguments for diametrically opposed conclusions. Two international conferences on forestry statistics held at Washington and Rome in 1947 clarified the most important definitions to some extent and fixed the conversion factors to be commonly used. Since then, the work has been carried on by working parties on statistics composed of experts from Europe and North America whose recommendations are made public through the Forestry Division's statistical publications. In order to make terms and definitions more generally applicable also to tropical forests, statisticians of these regions are being consulted to an increasing extent. Experience shows, however, that it is extremely difficult to lay down definitions of world-wide application in regard to such simple terms as " forests " or " annual fellings ".

The improvement of statistics and the introduction of new series of statistics required for the formulation of a forest policy constitute a continuous patient effort. Improvements have been brought about in many countries by the introduction of sampling methods for estimating both fellings and sawnwood production as well as for ascertaining the composition of stands. The Expanded Technical Assistance Program should be destined to play an important role, since it provides the possibility of organizing pilot sample surveys in various parts of the world and of assisting governments to improve their statistical services through the provision of experts and the granting of Fellowships for training technicians. The introduction of the United Nations' Standard International Trade Classification in many countries now makes possible an international comparison of the data on trade in forest products.

A big gap in the compilation of statistics appears, however, in regard to the consumption of wood and its products. Few governments compile systematic statistics on the consumption of wood by end-uses: in regard, for example, to the quantities of sawnwood consumed in housing, industrial construction, transport, packaging and wood-processing industries, and to the requirements of rural populations. Owing to this gap it is difficult to make long-term forecasts of requirements and, as a result, forest exploitation is too often a speculative matter involving devastation of the stands. In 1950 and the following years, a first attempt was made by FAO to compile statistics on end-uses, in order to determine the trends of timber consumption in Europe for the next ten years. Since that time, many European countries have introduced statistics based on the end-uses of all or some of the roundwood categories, and all countries are becoming increasingly aware of the importance of this type of statistics in forest economics. These have been incorporated in the " minimum long-term program for forestry and forest products statistics ", drawn up by the Forestry Division in the light of ten years' experience in international statististical work, which will be discussed in the near future by the various Regional Forestry Commissions.

The collection and dissemination of national forestry statistics is carried out on the basis of statistical questionnaires sent to FAO Member Governments. And, incidentally, the mere fact of having to fill in such questionnaires, prepared by highly qualified experts, has obliged countries to improve their national statistical services. The data are published in the FAO *Yearbooks of Forest Products Statistics*, which contain

FIGURE 6. *The old way. There is still a decided place for animal power in forest operations as the above scene of elephants piling teak logs in northern Thailand shows.*

Photograph: S. Bunnag

the most recent data on fellings in the most important roundwood categories, their utilization, the production of and international trade in sawnwood, sleepers, plywood, wood pulp, paperboard and fibreboard, and show the per capita consumption of certain wood products. It is noteworthy that the tenth volume has recently been issued, an anniversary that has not been attained by any other United Nations Statistical Yearbook. A comparison of the first volume with the last shows the progress achieved in international and national forestry statistics during this period: whereas, in the first years, some 80 countries only were able to reply to questionnaires, the last FAO yearbook incorporates the replies of 130 countries, representing from 90 to 95 percent of the world production of, and trade in, forest products.

A similar but more detailed survey concerning the production, trade, stocks and prices of pulpwood, pitprops (mine timber) and sawn softwood is made every three months for Europe and North America. The assembled data are published in the statistical annex to the *Timber Bulletin for Europe*, produced in collaboration with the United Nations Economic Commission for Europe. It is proposed to modify the form of presentation so as to obtain quicker release of the statistics and market reports.

Every five years, another FAO questionnaire seeks from Member Governments all available data on forest resources, forest areas, classification of forests in use, growing stock, gross increment, net growth, allowable cut, fellings and removals. An initial survey was made in 1947. It was repeated in 1953 and the results were published in the report entitled *World Forest Resources*. This volume contains the most complete statistical account of the forested areas of the world to be published so far.

In the field of forestry statistics, the work of the last ten years is encouraging. It shows that progress has been made in many countries, but it also shows that there still remains much to be done in order that accurate data may be available on which to base an increasingly efficient utilization of the forest resources of the world.

Commodity Reports and Special Studies

The complete data assembled in connection with FAO statistical publications and analytical appraisals makes it possible to supply accurate and timely information to an ever-increasing number of correspondents who send in the most varied requests. The Forestry Division has thus been able to organize an effective intelligence service.

It is also on the basis of this intelligence which FAO alone can collect on a world or regional basis that short-term market and commodity reports can be drawn up, and special studies undertaken are concerned with long-term forecasts.

Production, international trade, consumption and prices of most forest products are in constant fluctuation. It is natural, therefore, that production, distribution and price policies, as well as the problems of marketing certain categories of roundwood, sawnwood, plywood, pulp and paper should be periodically reviewed in commodity reports published in *Unasylva*. Such reports are often the starting point of efforts in the international field to prevent a short-term disparity between supply and demand or to encourage production and to eliminate obstacles to trade. Within the more limited framework of Europe, the forest products markets of the thirteen main importing or exporting countries, as well as the European market in general, are surveyed in the joint FAO and ECE publication, *Timber Bulletin for Europe*. A very summary survey of world forest production is always incorporated in the FAO annual, *The State of Food and Agriculture*. Although it is difficult to determine whether the rapid dissemination of statistics has helped to stabilize international markets, it may be said that FAO published

FIGURE 7. *The new way. Mechanical extraction in a hardwood stand in the United States. No country has developed such a variety of power equipment for forest operations as the U.S.A.*

Photograph: Hyster Company, Portland, Oregon

material is often reprinted wholly or in part in the most influential organs of the technical press and that the short-term forecasts have, in most cases, proved to be realistic.

Nevertheless, real planning will continue to be very difficult as long as there are no forward forecasts of felling or forest output. The European Forestry Commission has for some years discussed the matter of making short-term felling forecasts, with the result that the possibility has become a reality, which has greatly facilitated the development of forest industries.

Present-day world economic and social developments will undoubtedly lead to an increase in the consumption of roundwood and its products. In view of foreseeable economic developments, the increase in population and the improvement of standards of living, it is quite natural that the Forestry Division should be concerned to estimate, on the one hand, the future requirements for forest products and, on the other hand, the possibilities of world production to meet these requirements on a sustained yield basis. The first attempt at a world survey was made in 1946, as already mentioned, by the report on *The World Situation for Forestry and Forest Products*, published in Stockholm. Since then, the study of long-term problems has led FAO to direct its efforts towards the analysis of general trends in forest production for a whole region and special studies on specific products.

In collaboration with ECE, the first general study was published in 1953 under the title, *European Timber Trends and Prospects*. Reference will be made to it in connection with the work of the ECE Timber Committee. The only remark to be made here is that, from the methodological standpoint, the study opened up new possibilities, because future roundwood requirements were estimated on the basis of end-uses and not according to the tradition of starting from the various categories of roundwood.

A similar study is now being undertaken for Asia and the Pacific. The other regions will subsequently be surveyed and the whole of the results obtained will provide the bases for a world estimate of roundwood requirements and resources. The scope of these studies is obviously beyond the means of the Forestry Division alone and it is therefore encouraging to note that the Regional Economic Commissions of the United Nations are actively co-operating with FAO in these tasks.

The second activity in this field of long-term studies relates to certain specific products. These include the study prepared in co-operation with UNESCO, ECE and ECLA (the Economic Commission for Latin America) and published in 1954 under the title of *World Pulp and Paper Resources and Prospects*, as well as the study, *Pulp and Paper Prospects in Latin America*, which is based on the discussions of a meeting of experts that took place in Buenos Aires in 1954. A similar study is envisaged in the near future for Asia and the Far East.

During the past ten years, a constant decrease in the per caput consumption of certain categories of timber (sawn softwood and pitprops) has been noticed in Europe. This trend has been so marked in the last few years that foresters and manufacturers fear they may lose many traditional markets. A study is in process of preparation showing to what extent sawn wood has been replaced by other wood products, such as plywood or fibreboards or even materials other than wood.

FOREST POLICY

We have already stated what we mean by forest policy: defining for each country, each region and the world as a whole, the role that the forest, primary forest industries and ancillary activities must play in relation to the physical, economic and social environment of that country or region, and to the world economy.

The physical environment alters little with time. But its economic and social conditions, on the contrary, may change as each country seeks to improve the living standards of its peoples. Hence forest policy must also be a continuous creation. This is all the more difficult as the objectives set are for the future, and it takes a long time for any present action on the forest to reveal its effects.

Physical, economic and social conditions vary from one country to another, and from one region to another.

National and regional forest policies are bound, therefore, to differ according to time and space. World forest policy will also vary with time.

There are however, indisputable principles of forest policy limiting possible national, regional or world policies. The reason is that the forest has a permanent character: it represents a *renewable* natural resource, and furnishes permanent values, indispensable to life on earth, such as water and soil protection on the one hand, and wood production on the other, not to mention others less important.

The first principle is that every country, even the most unfavored from the forestry standpoint, *must* have a forest policy.

Ten years ago, it is no exaggeration to say that the governments of very many countries had no idea of this need. Hence FAO's persistent efforts to ensure that the need was indeed recognized. One of the Forestry Division's first publications was a study, *Forest Policy, Law and Administration*, designed specifically for this purpose. But it was greatly helped by the Third World Forestry Congress held at Helsinki in 1949. The foresters of the countries assembled at this Congress considered that the universal recognition of certain fundamental "principles of forest policy" was necessary for the development of their action,

FIGURE 8. *Finland depends to the extent of 80 percent of its economy on its forest products. It is to be noted that a well-known forester, Aimo Kaarlo Cajander, became Prime Minister of Finland, and Eino Saari, a long-time friend of FAO's Forestry Division, is now Minister of Social Affairs.*

Photograph: Mannelin, Malmi

and they requested FAO to formulate such principles with the advice and assistance of outstanding foresters.

The draft document setting forth these principles was discussed over a long time. It was submitted successively to all the Regional Forestry Commissions then existing and afterwards once more sifted over in detail at FAO Headquarters. Finally it was submitted in 1951 to the Sixth Session of the Conference of FAO which approved it unanimously.

It is only right to recall here the names of four foresters who were most active in these discussions and whose personal influence and wise counsels helped to overcome all obstacles: Lyle Watts, then Chief of the United States Forest Service, O.J. Sangar, of the United Kingdom, who was Chairman at that time of FAO's European Forestry Commission, Eino Saari, of Finland, who had organized and presided over the Third World Forestry Congress, and M. D. Chaturvedi, then Inspector-General of Forests, India.

No doubt at the time when it was adopted one might have questioned whether such a declaration had any real value. It has since become abundantly clear that it constitutes a basic weapon for foresters who, in every country, have constantly to remind their governments of the need for a forest policy based on sound principles. Ten years after the setting up of FAO and five years after this declaration, if there are still any countries that hesitate to formulate a sound forest policy, one may say that there is none where there is not an awareness of the need and importance of such a policy. One would not ordinarily associate forestry with countries such as Egypt or Iceland for instance, but they have not been slow to give it full recognition and to take action accordingly.

What are these "principles" of forest policy? The statement setting them out is divided into two parts. It distinguishes the "principles governing the formulation of a forest policy" and the "principles governing the implementation of a forest policy".

It may be worth while to go over these principles, as this can give a better understanding of the reasons why the Forestry Division selected the specific fifteen lines of activity already referred to.

Principles Governing the Formulation of a Forest Policy

LAND USE

The first of the "principles governing the formulation of a forest policy" is that each country should determine and set aside areas to be dedicated to forests. It specifies that the selection should take into account the country's economic and social conditions and "the close interdependence of all forms of land use".

Such a determination is often very difficult. In almost uninhabited areas and on the most unproductive or hilly lands, there is little doubt that large areas should be dedicated to forests, but even here intense competition between forest and other forms of land use may appear as soon as human populations spring up. The people must ensure an adequate supply of food for themselves and for their livestock. They may dispose sufficient resources and labor to make intensive use even of land that is poorly productive in its natural state. It is not necessary, in some instances, that the population should be dense or settled: it is perhaps nomadic modes of life that give rise to the most intense competition between the forest on the one hand and grazing on the other.

Are there any criteria whereby countries can be assisted in this determination? The Forestry Division has studied the problem, and promoted discussion by various bodies, particularly the Subcommission on Mediterranean Forestry Problems, the Latin-American Forestry Commission and the European Forestry Commission, and at the Fourth World Forestry Congress in India in 1954. It has undertaken studies on shifting cultivation, afforestation and reforestation policies, forest grazing and range management, all of which are more or less

closely connected with this problem. It has called in the aid of FAO's Agriculture Division.

But it seems that there are no criteria, although some countries have adopted a theoretical basis of maximum slope of land. But there are certainly ways of determining the desirable allocations of land-use patterns — taking into account social, economic and physical conditions and their foreseeable evolution. These methods, that FAO recommends countries to apply, must be based on certain fundamental knowledge.

This knowledge comprehends the influence of the forest on soil conservation, waterflow, protection against wind, air and soil temperature, the thawing of snow, and so on, which is particularly important for the forester. If he can, in fact, rightly claim a place for a natural or artificially created forest, it is where the forest exercises an irreplaceable protective influence on the other natural resources necessary to agriculture, industry and human life, namely, land and water.

Knowledge of forest influences and of their modifications as a result of various kinds of utilization of the forest (cuttings) or of forest land (grazing) is unfortunately incomplete. How far such knowledge has now advanced will be dealt with in a publication that the Forestry Division intends to issue in the future.

It is essential, however, to apply without delay what is already known and the Forestry Division is attempting to do so, particularly by making known, with the help of the Agriculture Division, the techniques for correct watershed management and range management.

Watershed management is of high importance. The water supplies of cities, towns, industries, hydroelectric plants and irrigation canals depend essentially on the proper utilization of the water from watersheds on catchment areas. A working party of the Asia-Pacific Forestry Commission is studying the problems involved. A development center on watershed management has recently been organized between foresters and agriculturists in Asia.

As regards the problem of forest and range grazing, there is no need to stress its effect on the forest. Particularly acute in its manifestations in the Near East, it is the subject of attention by the Near East Forestry Commission. In 1954, the Forestry Division brought together in Rome specialists from many countries who drafted principles of "forest grazing policy" which were subsequently approved by the Regional Forestry Commissions. This is an example of how the basic "principles of forest policy" can be elaborated in more detail in respect to a particular point of major importance for many countries.

Forest Management

The second principle governing the formulation of a forest policy relates to the management of forests and of forest production "in seeking to derive in perpetuity, for the greatest number of (the country's) people, the maximum benefits available from ... its forests".

Spreading knowledge of sound management practices has been, therefore, during these past ten years, a foremost task of the Forestry Division. Management is meant here in the broadest sense, including the protection of the forest against fires, pests and diseases, methods of planning and establishing artificial plantations or tree stands outside the forest proper, as well as the silvicultural treatment of natural forests and their controlled working so as to influence the yield in desirable directions both in regard to quantity and quality of production.

Many of the publications of the Forestry Division deal with these topics: they have been prepared either by the divisional staff or, under its supervision, by

Figure 9. *Dual use of the forest for timber production and grazing is often a necessary practice. Hereford cattle grazing in a pine stand in the southern United States.*

Photograph: U.S. Forest Service

FIGURE 10. Elements of Forest Fire Control *was one of the earlier publications of FAO. A most useful study tour in the United States was organized in 1951 jointly by FAO, the U.S. Forest Service and the Marshal Plan authorities.*

special consultants of international repute. Particular mention may be made of the "World Planting Manual" series. The titles in this series attempt to give information about proven practices in phases of afforestation operations (*Handling Forest Tree Seed*) or the use of certain species for artificial plantations (*Eucalypts for Planting*), or the formation of new forests under particular climatic conditions (*Tree Planting Practices for Arid Areas*). Another publication deserving mention is the *Forest Tree Seed Directory*, which is a useful reference document for anyone wishing to obtain seed and planting stock guaranteed by the certificates of quality and origin approved by the FAO Conference in 1951.

Just issuing publications is of course not enough to arouse interest. Other methods have been employed according to circumstances. Sometimes ideas are spread through the Regional Forestry Commissions, or special study tours are organized (on forest fire control in the United States in 1951 or on eucalypts in Australia in 1952), special bodies are created (Teak Subcommission), or technical conferences convened regionally (regional poplar conferences) or on the world level (World Eucalyptus Conference of 1956).

Emphasis in the Forestry Division's actions is tending to become focused on two aspects: tropical forestry, so as to make possible the full utilization of some of the last remaining forest resources still relatively unexploited, and forestry in semi-arid and arid areas, with the aim of rehabilitating areas that were formerly forested in ways suited to the physical and economic conditions of these areas.

The theme of tropical silviculture was given much attention at the Fourth World Forestry Congress at Dehra Dun, and a publication on the present status of knowledge is now being prepared by FAO staff. A recent study tour in the U.S.S.R. was specially devoted to problems of arid zone forestry and the Mediterranean Subcommission continues also to deal with them as one of its major concerns. The subject is also being studied from a broader standpoint in collaboration with UNESCO, collaboration with other Specialized Agencies of the United Nations being able to supplement enormously the action which it is possible for FAO to take.

The second "principle" of forest policy carries the implication of the development of suitably equipped modern industries and the introduction of efficient harvesting and conversion methods carried out by staffs of workers and supervisors operating under good conditions. The selling of the products thus produced must in turn be ensured by good business organization, for local and export markets.

On these points, too, the Forestry Division has taken action to assist and co-ordinate national efforts. For Europe, an essential organ for the surveillance of the international timber market is the Timber Committee of ECE, to which reference will be made further on. The Asia-Pacific Forestry Commission is about to sponsor recommended grading rules for hardwood logs and sawn wood. FAO's Technical Panels on Mechanical Wood Technology and Wood Chemistry are the technical bodies whose advice guides the action of the Forestry Division in the field of the processing industries. A Joint FAO/ECE Working Party, divided into many specialized study groups, is fostering progress in forest working techniques and, with ILO, in the training of forest workers.

Now the Forestry Division's efforts are being concentrated on the development of the pulp and paper, and board industries. Large-scale action is being developed in Latin America to promote the establishment of economically viable pulp mills, following the important

pulp and paper conference which took place at Buenos Aires in 1954. An international consultation on fibreboard and particle board was held at Geneva early in 1957.

Research and Statistics

The third "principle" of forest policy advocates that countries develop their knowledge of all the factors that need to be taken into account in determining such a policy.

This involves on the one hand the organization of research. In this field, the Forestry Division has practised what it preaches. Although it has no means of carrying out research itself, it promotes and agitates for the establishment of new research institutions. It took the initiative in organizing a regional forest research institute for Latin America which is now in being, and another for the Near East. Secondly, it tries to direct research towards the most urgent regional or world problems. Hence its close liaison with the International Union of Forest Research Organizations, and the creation within the Regional Forestry Commissions, of research committees to bring an element of co-ordination into research work within a region. Another effort in this direction has been the publication of a directory of research institutions, with particulars of their programs of work. This directory now needs bringing up to date.

Equal emphasis is given to forest research proper and to forest products research, the latter is of particular importance in connection with the development of tropical forest resources.

The compilation of statistics is no less necessary, in our view, than the organization of research. But enough has already been said in an earlier section on FAO's actions in this field.

Education of the Public

"Public consciousness of forest values should be developed by all means possible."

All countries seem to have realized that the support of an enlightened public opinion is necessary for the carrying through and even formulating forest policy. Prompted by FAO, most countries that had hitherto not yet done so, have organized annual Arbor Days or similar celebrations. Posters, publicity material and stamps have been issued and public relations drives undertaken. The Forestry Division itself has published pamphlets aimed at school teachers and children of school age. Many thousands of these pamphlets have been distributed and a number of countries have translated or adapted them.

Principles Governing the Implementation of a Forest Policy

Forest Law

The first of the "principles governing the implementation of a forest policy" recognizes the need of forest law to give effect to forest policy in consonance with the juridical forms and customs of each country.

Good progress has been made in this connection. The Forestry Division has contributed by spreading information about laws and particular provisions enacted in various countries and by directly advising individual governments, on request. It has published surveys on special questions, such as that on forestry associations and co-operatives, published in a recent issue of *Unasylva*, and submitted particular problems to the Regional Forestry Commissions or to special meetings; the topic of rights of usage is one example.

Administration

Forest law cannot be enforced nor the specialized techniques that sound forest management requires be applied unless there is an administration enjoying, within each country, a clearly defined status and staffed by suitably qualified personnel in all its grades.

This is the second principle "governing the implementation of a forest policy". The Forestry Division keeps a close watch on the development of forest administrations and, insofar as it is able, advises countries desiring assistance in this matter. There is still considerable progress to be made. Almost all countries now have an official service of some kind in charge of forestry matters, but, in many cases, it is still in a quite embryonic state. Perhaps the importance and status of the service can be taken as measure of the interest that each government attaches to its forest resources and to its forest policy.

Training

The last principle draws attention to the need, on the part of governments, to assure the professional training of specialized personnel of all grades and in all branches of the management of forests or the utilization and processing of forest products. Personnel are required not only to staff forest administrations and public services, but also to enable forest owners and forest industries to recruit the engineers, technicians and foresters that they need.

The Forestry Division attaches the highest importance to training and education. Some countries have been directly advised on the opening of schools. In other countries FAO has provided teaching staff, as in Chile and Liberia. It has arranged for existing schools, as in India and Cyprus, to train students from countries where there are no such schools, and helped, as in Latin America, various organizations to organize short-term courses. It has awarded many training fellowships under the technical assistance program. Several years ago a *Directory of Forestry Schools* was published which is now to be revised and expanded. To advise FAO in its work, there is a Technical Panel on Education in Forestry, composed of eminent persons specialized in this field and representing the various regions.

INTERNATIONAL ACTION - REGIONAL FORESTRY COMMISSIONS

The Regional Forestry Commissions are the bodies on which the Division has mainly based its international action; the reasons that led to the adoption of the regional approach to world forestry problems have already been given. We should touch briefly on how these Regional Forestry Commissions were set up, what their role is, how they have functioned so far, and the prospects that lie before them.

The role of the Forestry Commissions

The fundamental task of the Regional Forestry Commissions is to determine, within the scope of the "principles of forest policy", the forest policy appropriate for the region concerned.

The Commissions are composed of representatives of the governments of the regions. At each session of a Commission, the governments are requested to report, in accordance with a previously established outline, changes in national forest policy since the last session, the progress achieved in its implementation, whether through improved forest laws, alterations in administration, the development of forest industries or markets, or as a result of technical progress in silvicultural practices, the modernization of equipment or working methods in forest operations or processing industries, and so forth. The report is also supposed to include information on the volume of fellings during recent years, and on the estimated volume for future years.

From the analysis of these reports from all countries, individual governments can derive useful ideas for formulating and implementing their own forest policy. But the Commission's job is to:

1. synthesize from these reports what is the development in forest policy for the region as a whole;
2. taking into account the information available on trends in land-use and wood consumption, determine whether this development in forest policy is consonant with the trends and whether forestry is accorded a suitable place in development plans for the regional economy;
3. submit recommendations to governments of the region through the Director-General of FAO as to:
   (*a*) the necessary adjustments that should be made in national forest policies, and
   (*b*) any desirable co-ordination that should be made between national forest policies so as to bring them into line with the regional forest policy;
4. examine and define the main difficulties that stand in the way of implementing recommended policies, whether national or regional;
5. recommend suitable measures to overcome these difficulties, or, if that is not immediately possible in the present state of forestry knowledge, to set up technical bodies to study the problems in detail and to report thereon to the Commission.

Establishment and functioning of the Regional Forestry Commissions

All the Regional Forestry Commissions now existing were established by the Conference of FAO following a regional conference organized under FAO sponsorship by one of the countries of the region. The purpose of these conferences was to review the main forestry problems of the region and indicate ways in which they might be solved.

The Commissions, under their own elected officers, meet, as a rule, every two years, either at the seat of the FAO Regional Office or in one of the member countries of the region. The secretariat of the Commission is furnished by the Forestry Division, and it is responsible not only for preparing sessions, but, in the intervals between, for maintaining contacts between countries of the region, and carrying out any projects entrusted to it by the Commission, and collecting such information as the Commission may direct.

The Forestry Division also provides services for the technical bodies that the Commissions deem it necessary to set up, subcommissions, committees or working parties. Some of these subsidiary bodies such as the Mediterranean Subcommission, to which special reference will be made further on, are dependent on more than one Regional Forestry Commission. Others are joint bodies with another organization independent of FAO.

Work of the Regional Forestry Commissions

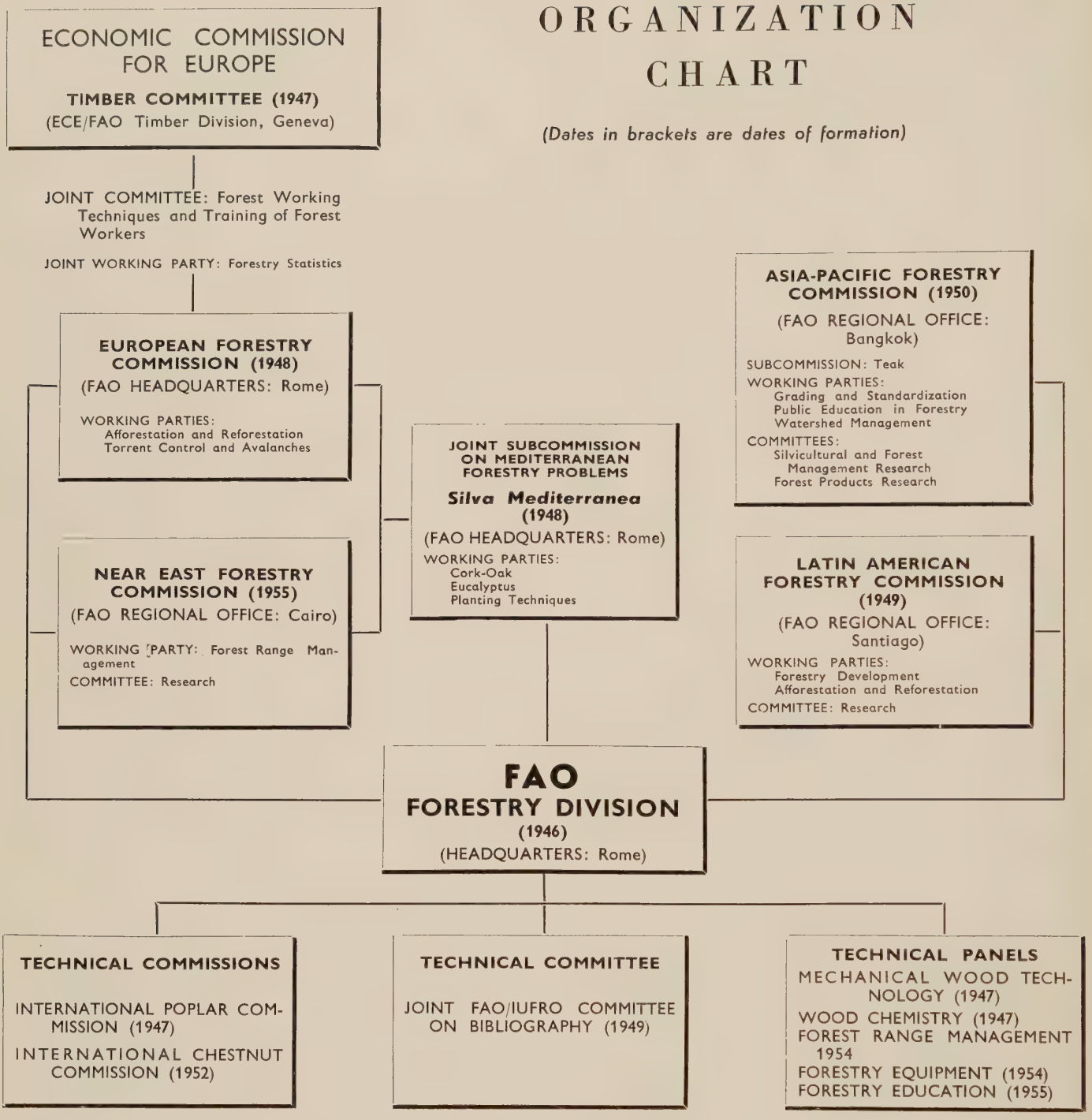
The Regional Forestry Commissions have, on the whole, successfully filled the role that was expected of them. The submission of national progress reports to each of the sessions of a Commission has become an established procedure. They are generally carefully prepared and sometimes so complete that a series of such reports permits following the history of forestry in some countries in detail over the years. The reports submitted to the European Forestry Commission in 1951 were specially published under the title *National Forest Policies in Europe*, but lack of funds has prevented this becoming a regular feature.

But in their endeavor to formulate regional forest policies that were to serve as a guide to countries in formulating their own national policies, the Regional Forestry Commissions came up against a number of difficulties.

A regional forest policy and still less a national forest policy cannot and should not be the mere reaffirmation, for the particular region or country, of the general principles approved by the FAO Conference in 1951. Forestry represents a merger of agricultural, industrial

ORGANIZATION CHART

(Dates in brackets are dates of formation)



and trade interests, and a sound forest policy can only be formulated by taking all three into account. More precisely, it must provide the answer to three essential questions:

1. What place should be assigned to forestry in land-use policy, and to what protective or productive purposes is it advisable to allocate the areas that are to be dedicated to forest?
2. What place should be given to forest industries; what are the kinds of industry whose development should be encouraged and with what kind of raw material will they need to be supplied?
3. What are the real wood requirements for rural consumption — which is and will no doubt always be very extensive — and for the wood-using industries and trade? Apart from the national production, what possibilities are there of meeting these requirements?

In giving answers to these questions, it is necessary to take into account the development of the general economy of each country, each region, and world trends too. One must try to foresee what that development will be in the short, medium and long term. It is possible, to a limited extent, to make specific short-term

adjustments in forest policy. On a medium-term basis, the range of possibilities is greater. On a long-term basis, there is in general a considerable choice that will involve no dangers for the forest.

A sound forest policy should therefore be essentially a long-term affair. Undoubtedly economic development becomes decidedly less easy to forecast as one passes from short to long term, and this presents an inevitable difficulty for forest policy. But it can be overcome by drawing up alternative courses based on a number of different assumptions, so that appropriate actions are foreseen for several alternate possible developments.

To answer the three questions above, one must have, in regard to each region and country, an accurate appraisal of the present situation and of possible trends in respect to the three fields of land-use, industrial expansion, and the balance between wood resources and consumption requirements. At the regional level, and often at the national level, such appraisals did not exist ten years ago.

In trying to formulate regional policies, the Regional Forestry Commissions, therefore, could rely only on partial data, or even had to proceed empirically. For most of the regions, the land-use problems and probable trends are better known than the other two elements of forest policy. At least one can say that, when the association between man and nature has given rise to a relatively stable pattern of land-use, it is relatively easy to perceive the deficiencies of this pattern, and to infer the proper place that the forest should occupy in it. In some regions, there is consequently a tendency to formulate forest policy in consideration only of land-use, which is assumed to have reached a desirable structure. This is obviously inadequate.

To help the Regional Forestry Commissions fulfil their function adequately, detailed appraisals covering the three points have had to be scheduled, and considerable effort has been put into this task during the past few years. A first study of this kind was published in regard to Europe in 1953 (*European Timber Trends and Prospects*), and it has enabled the European Forestry Commission to come up with a number of recommendations which may be regarded as leading towards a real regional forest policy. Similar studies in regard to other regions are under way or will shortly be undertaken, and these should provide the other Commissions with the data that they now lack for formulating reasoned forest policies.

However, the Regional Forestry Commissions have undoubtedly already done much useful work. Thanks to the accumulated experience of the delegates who attend the sessions, and on a basis of common sense rather than certitudes, they have perceived the weak points of the forest policies of each region and the obstacles to be overcome. As a result, they have been able to make useful recommendations which governments have followed as far as they could, and to establish technical bodies that have contributed much of value. And by no means least, the exchange of experience and the personal contacts established between those responsible for the forest policies of the various countries within each region have yielded many good results.

European Forestry Commission - ECE Timber Committee

The uneven distribution of forests among the countries that go to make up Europe has given rise to a large intra-regional trade in forest products. About half of the production of sawn softwood of the countries situated in the north and east of Europe is exported annually to meet approximately half of the consumption requirements of the countries situated in the west of the continent and around the Mediterranean. European trade in sawnwood constitutes about two thirds of total world trade and has long been the subject of international attention.

After the second world war, the forestry situation of Europe appeared to be difficult. The forests seemed to have been overcut for a long time, and also a large number of industrial concerns had suffered from the war or possessed only worn-out or out-of-date equipment. An enormous amount of timber seemed to be required for the reconstruction and the maintenance of rural and urban housing neglected during the war, and to meet the development of new industries, and other needs. But, in 1946, European imports of coniferous sawnwood amounted to two million standards only, less than half the prewar level, at a time when there was a particularly large demand.

Because of the apparent critical timber shortage in Europe, the FAO Forestry Division initiated its regional action first in Europe and, following a decision of the 1946 Copenhagen FAO Conference, it convened, in April-May 1947, an International Timber Conference at Mariánské-Lázně, Czechoslovakia.

To organize this conference required lengthy preliminary negotiations, but the result was discussions on a high level, even if they were sometimes acrimonious. The Conference recommended an immediate program to improve supplies of sawn softwood to countries suffering from a shortage, and a long-term program to meet the expected increasing requirements of the European continent for timber and forest products. It broadly called for:

1. a European Forestry Commission to be set up by FAO to enable representatives of European countries to meet together from time to time to exchange information and views about their problems in the field of medium and long-term forestry;
2. the recently established United Nations' Economic Commission for Europe to set up, with the technical assistance of FAO, a Timber Committee to pay special attention to increasing available timber supplies and decreasing waste of wood, aiding in reducing economic difficulties, and securing the satisfactory distribution of available timber supplies.

European Forestry Commission

First of its kind, this Commission recognized from the outset the main obstacles hindering the development of national forest policies in Europe. These obstacles are of two types: some relate only to certain areas of the region that have peculiar social and physical conditions, namely, the Mediterranean zone and the mountain areas; the others are practically uniform for the whole region.

To deal more particularly with problems relating to the Mediterranean zone, the Commission soon set up a Subcommission on Mediterranean Forestry Problems, which is discussed later in this paper; and it entrusted the study of the main forest problems of mountain areas to a permanent working party on torrent and avalanche control. This working party has since met every two years to keep its members abreast of progress made by means of study tours organized in the various mountainous countries of the region. It has now on its program the study of four particularly important questions: avalanche control, sedimentation of reservoirs of large hydroelectric projects, modern methods of constructing and maintaining torrent control works, and land-use and soil conservation in alpine areas.

Problems concerning the region as a whole are dealt with by the Commission proper, and by its working party on afforestation and reforestation. The Commission has taken measures to follow and, as far as possible, to forecast the development of the annual forest cut, to facilitate the control of fires, pests and diseases, and to make possible an exchange of educational and publicity films between the countries of the region.

The working party on afforestation and reforestation follows the progress of planting programs in the various European countries, studies the development of planting techniques, and makes recommendations in regard to planting policies.

The study already mentioned, *European Timber Trends and Prospects*, was started jointly by FAO and the Economic Commission for Europe (ECE) in 1951, with the aim of forecasting the wood requirements of the continent in 1960 and after, taking into account the prospective economic development of the region.

This study, in effect, enabled the Commission to formulate a broad regional forest policy, although it paid only slight attention to land-use problems. This seemed justified by the fact that, for Europe as a whole, the areas occupied by forest and devoted to other forms of land-use are relatively set. Nevertheless, the study revealed that, to meet future needs for timber, a great effort in afforestation would be required, in a continent where it is difficult to find land for planting without entering into competition with agriculture and livestock farming. The scope of the working party on afforestation and reforestation had thus to be considerably broadened, as also that of the Mediterranean Subcommission, which now also is concerned directly with this problem.

Another feature hindering the development of timber production in European countries is the large extent of private and poorly managed forests and particularly of "small woodlands". A study of this situation has been made by the European Forestry Commission and measures have been recommended to improve matters.

ECE Timber Committee

This Committee met for the first time at Geneva some months after the 1947 Mariánské-Lázně Conference. At the beginning it held fairly frequent meetings but now meets once a year.

Its activities may be said to have extended over three phases.

Soon after it was set up, the Committee had to give its exclusive attention to the possibilities of arranging greater supplies for the countries suffering from postwar shortages, and of getting the importing countries to curb their purchases. At the same time, it had to encourage an expansion of European sawnwood production. The Committee was thus called upon to collaborate with the International Bank for Reconstruction and Development (IBRD) in the granting of credits to some exporting countries of Eastern Europe to enable them to buy in dollars the equipment they needed in order to step up their forest output. Loans amounting to more than U.S.$10 million were allocated to Finland and Yugoslavia, and this is one of the rare instances of an International Bank credit allocated as the result of a recommendation of another international body.

These loans and others contributed to the rapidity of the recovery of European sawnwood production. Two years after the Mariánské-Lánzě Conference, the sawn softwood production of the exporting countries in the east and north of Europe was 20 percent higher than in 1947. This expansion of production was supplemented by a number of other measures: in particular, drastic restrictions were imposed upon consumers in the countries where supplies were short; and there was a considerable increase of supplies from North America, so that European imports and of the countries around the Mediterranean increased by 70 percent between 1946 and 1950. There was thus no critical timber shortage during the first years of postwar reconstruction.

The Timber Committee then entered a second phase of action, with the attention of both delegates and the secretariat centered on the study of the long-term trends in production and consumption in Europe, to which reference has already been made. Published in 1953, *European Timber Trends and Prospects* revealed that the potential increase in European requirements for sawnwood and pulpwood was considerably higher than had hitherto been suspected. It was estimated that European pulpwood requirements would increase during the decade 1950-1960 from 40 million to more than 60 million cubic meters, and only a "dynamic forest policy" was likely to ensure the requisite supplies of raw material for the pulp and paper industry.

At the time of publication, this conclusion seemed so startling that the general reaction of experts was to consider the estimates arrived at by FAO and ECE as

FIGURE 11. *The International Timber Conference held at Marianské Lázně (Marienbad) in 1947 was the first of the regional forestry conferences to be organized by FAO. Jan Masaryk, then Foreign Minister of Czechoslovakia, opened the proceedings.*

Photograph: FAO

grossly exaggerated. Subsequently, events have confirmed the forecasts of the study in a striking manner and, in 1955, European woodpulp consumption had already reached the lower limit of the estimates put forward in relation to 1960. It is almost certain that, by the end of the decade considered, European pulpwood consumption will have reached and probably exceeded the maximum estimates of the study. The exercise was therefore useful and it is in fact to be hoped that the study in itself helped to stimulate pulpwood production in all the European countries, with a resulting increase in paper production in keeping with European and overseas requirements.

As regards sawnwood, the study brings out the fact that the evolution of building design and techniques, and the relatively high cost of timber in relation to other building materials, puts a check on the expansion of demand. Nevertheless, the whole development of industrial activity, and particularly of housing construction in Europe, is such that European sawnwood consumption is now slightly higher than in 1950 and seems to have a tendency to increase still further. European sawlog production being quite insufficient to meet all requirements, the study concluded that either much larger exports from North America or a renewal of sawnwood exports from the U.S.S.R. were required in order to ensure a balance in Europe between requirements and supplies.

The publication of *European Timber Trends and Prospects* also initiated the third phase of the Timber Committee's history in that it marked the beginning of regular participation in the Committee's work by the U.S.S.R. and other countries of Eastern Europe. The resumption of exports of Russian timber, recommended in the study, began and, since 1953, these exports have been made at a level that has served to meet the increased requirements of European importers without any excessive fluctuation in prices, despite the reappearance on the market of such a big supplier as Russia. The stabilizing effect of the contacts established within the Timber Committee was particularly marked during 1956 when the demand for imports fell considerably. Despite the drop in the volume of transactions, the price level only declined by about 10 percent. This fact is all the more remarkable in that a similar situation, ten years after the end of the first world war, led to a crisis in the timber trade that has not yet been forgotten.

The Timber Committee has become a European institution whose authority is generally recognized. Its annual sessions bring together, around the table, delegates who, despite the divergent interests they are called upon to represent, have established a spirit of co-operation and confidence between themselves. As a result, the review undertaken each year to determine the European timber supply and demand position for the following twelve months is of considerable value.

Operating in regular liaison with the FAO European Forestry Commission, the Timber Committee deals with an increasing number of technical problems directly or indirectly connected with the European trade in sawnwood, pitprops, pulpwood and other forest products, such as forest working techniques, the establishment of a more complete and uniform system of European statistics, and standard sale contracts.

The Committee has become an outstanding example of useful co-operation between different United Nations agencies and of the technical and administrative advan-

tages to be gained thereby. Although the Timber Committee is officially a body of the United Nations Economic Commission for Europe, an agreement concluded between the Director-General of FAO and the Executive Secretary of ECE guarantees that all the actions of the Committee shall be in keeping with FAO forest policy: the officers forming the secretariat of the Timber Committee at Geneva are FAO officers belonging to the Forestry Division, and at the same time ECE officials. In this way there is an exemplary avoidance of the risk of overlapping.

Joint Subcommission on Mediterranean Forestry Problems

In 1948, the European Forestry Commission, in recognition of the need to treat specially problems of soil conservation, afforestation and the improvement of the forests in the Mediterranean area, set up a Subcommission on Mediterranean Forestry Problems, which should lay the basis of a forest policy for the distinctive Mediterranean region.

After the FAO Conference had established a Near East Forestry Commission, this Subcommission was transformed into a Joint Subcommission of the two Commissions, which could also invite other member countries with similar technical problems to take an active part in its work.

Thus established on a broadened basis, the Subcommission continued the work of the earlier *Silva Mediterranea,* which was established in 1922 following the 11th International Congress for Agriculture and Forestry held in Madrid. The purpose of this body, which continued its practical work until 1936, was to deal with all the forestry problems of the Mediterranean area and to cultivate a public understanding of forest values.

FAO's Subcommission has held meetings in Rome (1948), Algiers (1950), Istanbul (1952), Athens (1954), and Nice (1956), and all the sessions have included study tours.

It has concentrated its attention on correct land-use principles and practices:

1. the productive and protective functions of the forest in the region and the prime importance of the protective functions;
2. the need to establish new forests, limiting planting, however, to land suited to the purpose;
3. co-ordinated measures to increase the productivity of forest industries, grazing lands and agriculture;
4. control of grazing and culling herds to improve the breeds, with liberal compensation to offset changes in the way of living of large population groups;
5. the possibilities of soil rehabilitation by methods other than planting of trees but equally effective for soil conservation and the regulation of water flow, and that permit an intensive land-use with better standards of living;
6. the importance of local tree plantations and small woodlands, both for timber production and the protection of agricultural crops, and for giving substance to small farms.

Translated into practical action, this has meant since 1956 collaboration with a regional working party set up by ECE and composed of experts from Greece, Italy, Turkey and Yugoslavia, to assess a number of specific projects for forestry development that would contribute to the economic development of southern Europe.

Subsequently the Subcommission requested the Director-General of FAO and the Executive Secretary of ECE to undertake fundamental studies for Eastern Mediterranean countries, in order to formulate coherent and dynamic forest policies looking to a real social and economic development of the area. Details of the studies and the methods to be used are still under discussion.

A map of the true climatic "Mediterranean region" and of the transition areas with which the project will be specially concerned, is shortly to be published.

A working party on cork-oak, an important species for the region, was set up at Algiers by the Subcommission in 1950 and has met during the regular sessions of the Subcommission and also held two special sessions in Portugal in 1951 and in Spain in 1955. A working party on eucalyptus, one of the useful quick-yielding species for the area, was set up in 1954.

Latin-American Forestry Commission

The Latin-American Forestry Commission came into being following a recommendation of the regional Conference on Forestry and Forest Products convened in April 1948 at Teresópolis, Brazil.

This region was selected as the second where FAO action should be started because the vast forest resources, still practically untouched, offered the possibility of new timber supplies both for hungry markets within Latin-America and for export elsewhere in the world which would yield foreign exchange.

Experience has been, however, that it is the one region where the longest period of time will be required before substantial results can be achieved. Few Latin-American countries had professional forest administrations eight years ago, and the cadres of those that now exist today are often disproportionately small. Few countries have a forest policy, and generally, their forestry efforts are desultory and concentrated mostly on reforestation in areas particularly short of timber supplies or dangerously subject to erosion.

The establishment of the Commission has certainly had a stimulating effect and has demonstrated to governments the need for national forest policies, and how these may be formulated. It has also afforded opportunities for contacts between the relatively few trained foresters of Latin America. Some subsidiary technical bodies have been set up by the Commission but without major result, because the foresters who could collaborate in their activities are already overburdened with re-

sponsibilities in their own countries. Thus while the outlines of a regional or sub-regional forest policy are slowly becoming clearer, much progress still remains to be made.

This is not a matter for surprise. Here is a new world just entering into a phase of accelerated development. Its needs and where it is heading are not understood. A study of the present situation in regard to production of forest products, consumption and trade, and future trends, is about to be undertaken, supplemented by another investigation into land-use trends. A large part of the land in the region is still subjected to what may be called extensive use, in contrast to intensive utilization. The practice of shifting cultivation still prevails over large areas, even in the case of economic tree crops requiring highly developed techniques, such as coffee. Great tracts of land have still to be settled by man. In short, there is not an already relatively clear separation between the various modes of land-use as is the case in most of the other parts of the world. The dividing line is constantly shifting, and the final pattern will depend on the economic development of each country. The trends in land-use and of the place to be assigned to forests must, therefore, be the subject of detailed study, if a regional forest policy is to be elaborated for Latin America.

The two complementary investigations will form the main concern of this Forestry Commission over the next few years.

It must not be overlooked, however, that some countries, for instance Brazil, Chile, Ecuador, Guatemala and Honduras, have already taken advantage of the Commission's deliberations and recommendations in improving their forest laws. There has also been much progress in the organization of forest services: some governments have allocated much larger sums for their work.

The need for expanded forest research has been stressed continually by the Commission and much effort has been put into establishing a regional forest research center. Thanks to the generous co-operation of Venezuela, this center is now a reality and has been established at Mérida, with the help of one of the chief forestry faculties of the continent. In addition, a committee on research is being created within the Commission.

It has become clear that, while the formulation of far-reaching forest policies has no urgent appeal for governments in the present state of development of Latin-American countries, on the other hand, the expansion of new forest industries must proceed apace with economic development. In fact, important modern industries are being established or planned in many countries of the region. FAO, through the Expanded Technical Assistance Program, has endeavored to channel this development in the right directions. Its regional and world meetings on technical subjects have also served to guide industrial expansion, particularly the building up of pulp and paper production. The Forestry Division feels that the extension of forest industries must in large degree be planned and co-ordinated, and it is to be hoped that governments of the region will determine their forest policies so that exploitation does not outrun conservation of the resource which might wholly jeopardize the interests of the region.

Asia-Pacific Forestry Commission

From the beginning, this Commission, set up following the regional forestry conference organized in March-April 1949 at Mysore, India, interested itself in formulating regional policy. When the draft "principles of forest policy", referred to earlier in this paper, were submitted to the Commission for review, delegates availed themselves of the occasion to elaborate a text related in detail to the problems of the Asia and Far East region.

This was not unexpected because most countries of the region have long had their own definite policies. India was, of course, the first to lay down an intensive forest management. New Zealand and Australia come within the orbit of membership of the Commission, and they have steadfastly pursued specific policies since the end of the last century.

It should be noted that, save in Australia, Japan and New Zealand, the national forest policies of most of the other countries are founded on land-use considerations, and the same must apply for any regional forest policy. Knowledge is still lacking of the true regional picture in regard to timber trends and requirements, and how supply and demand can balance, but FAO, with the United Nations Economic Commission for Asia and the Far East, is now attempting to build up this picture.

This does not mean that the problem of the relations between forestry and other forms of land-use has been completely solved for the region. While the policy to be followed has been settled in principle, implementation comes up against great obstacles. For example, shifting cultivation is still practised in many areas, while forest grazing is a very difficult problem. It is certain that, with industrial expansion and advances in agricultural techniques, the general land-use pattern will gradually be modified and forest policy must be sufficiently flexible to adjust itself accordingly.

From time to time, the Commission establishes the special working parties. The most successful to date has been the working party on standardization and grading of forest products entering channels of trade. Recommended standards for the nomenclature of commercial timbers, and for the grading of sawn hardwood and logs, are likely to be published this year.

The Commission created fairly recently a Teak Subcommission, under an independent chairman, which held its first session in February 1956. The Commission has established a working party on watershed management, which has a vast field of interest to deal with. A first meeting has just been held on the occasion of a development center on watershed management organ-

FIGURE 12. *The first regional forestry conference for Asia and the Pacific and the third in the series organized by FAO, was held at Mysore in India in 1949. India's Minister of Food and Agriculture inaugurates the conference, with the Maharajah of Mysore seated beside him.*

Photograph: Press Information Bureau, Government of India

ized in India jointly by FAO's Agriculture Division and the Forestry Division.

A Research Committee has also been established to co-ordinate the work programs of the existing forest and forest products research institutes in the region, so as to avoid duplication of effort. At the instance of the Commission, a regional seminar on statistical methods in forest research was organized last year in co-operation with the Forest Research Institute at Dehra Dun, India.

Other projects with which the Commission has been concerned are:

1. fuelwood plantations, and the possibilities for more efficient use of fuelwood which is the basic fuel for many countries of the region;
2. shifting cultivation, on which case-studies have been undertaken both in this region and in others with a tropical climate. Much data on this subject have now been collected and it should be possible to put forward recommendations on control of the practice appropriate to existing social and economic conditions;
3. exchange of selected forest tree seed;
4. public education about forestry and conservation of renewable resources;
5. in collaboration with the Economic Commission for Asia and the Far East, railway sleeper production and specifications; poles for electric transmission systems; and the development of rural and urban housing designs and materials.

In short, the work of the Asia-Pacific Forestry Commission is developing very successfully and is likely to prove more effective when the projected economic study on wood resources and requirements can point further directions for its work.

Near East Forestry Commission

It might once have seemed a utopian idea to arouse interest in forestry in countries of a region where forestry has been so long and traditionally neglected.

Nevertheless, after patient preparations and aided by the eager support of technicians in the various countries, a regional forestry conference was organized at Amman, Jordan, in December 1952. This conference studied the particular problems of forestry in the region, and recommended measures to overcome the difficulties and apathy encountered by forest services. It defined the main points on which forest policy should concentrate as publicity and propaganda, afforestation, range man-

agement, and products utilization. Particular attention must be paid to the training of new cadres of technical personnel, and to the implementation of a regional research program. The Conference also firmly recommended the establishment of a Near East Forestry Commission, such as existed for other regions.

The Commission finally came into being at a first and very interesting session held in Teheran in 1955. The statements on progress in forestry made by delegates showed that considerable and indeed surprising advances had been made since the Amman Conference. Perhaps in part these might be attributed to the regional seminar on forest policy organized by FAO at Ankara in 1954.

Recent political events in the region have inevitably affected the Commission's work, and it is too early to judge the direction that it will take. A sound regional forest policy is relatively easy to formulate. Above all it must aim at establishing a satisfactory balance between forestry and other forms of land-use: the productive functions of the forest must for the time being take second place. A study on wood resources and requirements of the same kind as for other regions is provided for in the Forestry Division's future program of work.

There is, however, an urgent necessity to preserve the last remaining intact forests and to make provision for meeting the most pressing local requirements by establishing artificial plantations, especially of quick-yielding species such as poplar or eucalyptus. A regional poplar conference was organized by FAO in 1954 to give an opportunity for technicians in the region to meet with their counterparts from Europe and discuss the cultivation of suitable poplar species and varieties, and modern breeding techniques to obtain more volume and better quality of timber. The Mediterranean Subcommission has organized study tours dealing with eucalypts.

The shortage of land suitable for intensive agriculture demands close integration between tree planting and farming: trees and woodlands can usefully furnish timber at the same time that they afford protection to food crops. Shelterbelts, plantations for sand fixations or, again, irrigated copses and groves along canals or grouped on the less fertile terrain, must be established.

It is, also, essential to pursue policies permitting both trees to grow and livestock to be grazed on the same ground: the erratic ranging of herds and flocks and the nomad way of life will no doubt continue for a long time to come. Foresters, of whom the numbers are still pitifully small in the region, are already fully aware of the need for this, and the response of their governments is on the whole satisfactory.

OTHER INTERNATIONAL ACTIVITIES

A number of autonomous international bodies exist for certain specialized fields of forestry which are of direct interest to FAO because of their bearing on forest policy. FAO maintains liaison with such bodies. In regard to two of them, specially close relations have been established: these are the International Poplar Commission and the International Chestnut Commission. The Forestry Division furnishes secretariat services and in exchange can avail itself of the voluntary collaboration of highly competent experts.

The Division has also been providing secretariat services for the non-governmental International Union of Forest Research Organizations, which since 1890 has existed to encourage close contacts between specialists in the various branches of forest research. The Union in turn has co-operated in fostering research on problems of direct concern to FAO or to the Regional Forestry Commissions.

For many technical fields no special agencies exist and the Director-General of FAO has either established advisory panels of experts or organized a series of special meetings. Subjects covered in this way are, for example, mechanical wood technology, wood chemistry, pulp and paper development, forest range management, eucalypts, and education and training in forestry. It will be appropriate to elaborate a little on activities of this sort, which have furnished FAO with much useful background information at minimum cost to Member Governments and have helped to resolve several debated questions.

International Poplar Commission

Sponsored by FAO, the International Poplar Commission came into being in 1947 at Paris following an international congress organized by the French Government. The following countries are now members: Argentina, Austria, Belgium, Egypt, France, Germany, Iraq, Iran, Italy, Netherlands, Spain, Sweden, Switzerland, Syria, Turkey and the United Kingdom. Pakistan and Yugoslavia have applied for membership, and other countries that have participated in the meetings of the Commission or maintain liaison with the secretariat are Canada, Chile, Czechoslovakia, Finland, Israel, Japan, Korea, Poland, the United States of America and Uruguay.

The Commission, although having special relations with FAO, is nominally independent. It has its own statutes and rules of procedure, and its activities are supervised by a Permanent Committee comprising the President, Vice-President, a representative of the Director-General of FAO, the Secretary, and nine members.

Sessions have been held, in Italy (1948), Belgium and the Netherlands (1949), Switzerland (1950), the United Kingdom (1951), Italy (1952), Germany (1953) and Spain (1955); the Ninth Session will take place in Paris this year. In connection with some of the sessions, international congresses have been organized by the host country and have secured a very wide attendance both from the member countries of the Commission and from non-members. Sponsored by FAO and the

International Commission, a regional Poplar Conference for the Near East was organized in Damascus in 1954, and for Latin America in Buenos Aires in November 1956.

Between sessions, activities are carried on by national committees. Each member country undertakes, in fact, to set up a national committee to put into effect the recommendations of the Commission and bring to its notice the specific problems that are being studied. These committees are themselves particularly active in organizing national or local congresses with study tours and field discussions.

The experience acquired over the past ten years has been collated by the Permanent Committee in a study entitled *Poplars-Their Contribution to Timber Production and Land-Use*, which is now in course of publication by FAO in three languages.

Briefly, the work of the Commission has covered the following topics.

Identification and nomenclature

In line with established botanical nomenclature, the Commission has laid down a nomenclature for the genus *Populus*, and in particular for the section *Aigeiros*. It has called on member countries to carry out surveys of distribution of species according to a standard descriptive card, to establish populetums, and to undertake varietal control in order to ensure that only poplars of known origin and quality are propagated and introduced. The Commission has indeed become the international authority for the registration of poplar names.

The Commission first concentrated on black poplars and then extended its attention to white poplars and aspens: it now intends to study the genus *Salix*, and give special attention to the poplar sections *Tacahamaca* and *Turanga*.

FIGURE 13. *Thirteen-year-old poplars in an experimental plantation at Casale Monferrato.*

Photograph: Istituto Sperimentale per la Pioppicultura, Italy

Cultivation methods

Considerable information has been exchanged on nursery and planting techniques, and matters of tending, spacing, thinning, pruning, fertilizer application, and associated crops, have been dealt with at length by the Commission.

It has also investigated comparative growth rates and, having recommended appropriate statistical methods for experimental work, is now engaged in standardizing the terms and procedures to be adopted.

Pests and diseases

The Commission has advocated national surveys on pests and diseases and has recommended certain regulations governing the exchange of cuttings between countries. A survey is now under way on *Dothichiza populea*.

Genetics and selection

Attention has been given to this subject at each session, but no special recommendations have been made.

Utilization

By standardizing a test form (physical, chemical and mechanical properties), drawn up in consultation with FAO's technical panel on mechanical wood technology, the Commission has facilitated the exchange of comparable data on the properties of the various clones which are cultivated. The form indicates the procedure to be followed immediately after felling so that samples from countries without special research facilities can be sent abroad for mechanical and chemical testing. The Commission has also been concerned with linking up adaptability for industrial uses with the clones and growing conditions that produce the timber: laboratory testing has not proved adequate and the Commission has turned to semi-industrial tests which appear to be more satisfactory.

International Chestnut Commission

Castanea is a genus of importance in many parts of the world, both for its timber and fruit. In 1950, a chestnut congress was organized in France in conjunction with FAO, which resulted in the creation of a panel of experts to pursue the problems involved in chestnut growing, according to an agreed program of work.

(*Continued on page 77*)

World Forestry in Stamps

UNION OF SOVIET SOCIALIST REPUBLICS: (*18.10.1949*). A set of six stamps was issued to encourage Forestry and Field Conservancy in the Soviet Union. The outstanding stamp is the 40 kopek value which carries a map of the southwestern area, showing the shelterbelt system established to assist agricultural production by improving the local climate. Illustrated in the other stamps selected are: special tree planting machines used in the establishment of shelterbelts, and the importance of arousing in youth an awareness of the value of tree-cover. The role of forests in relation to agriculture is stressed, in the right hand border of each stamp, which is decorated with different motifs of forest leaves and ears of wheat.

TAIWAN: (*12.3.1954*). Recreation and shelter are the themes of one of a pair of stamps issued in connection with National Tree Day.

TAIWAN: (*1.4.1955*). One of a pair of stamps issued as a second set released by the Formosa Government to encourage national interest in afforestation. The theme illustrated emphasizes the role of forest cover in water conservation.

KOREA: (*14.12.1954*). Issued in connection with arousing an awareness to the value of forest cover, the design is of a seedbearer and a seedling with, in the middle background, a representation of forested hills depicted as green and white pyramids. The sale of this series coincided with the holding of the Fourth World Forestry Congress at Dehra Dun, in India.

KOREA: (*6.3.1953*). Issued in connection with their annual Tree Loving Week, which was first inaugurated in 1949. The first day of the week is called Arbor Day and perpetuates an occasion which was first established in 1911 together with new forestry regulations encouraging reforestation and the formation of forestry associations. This issue aims at arousing public opinion to the urgent need for reestablishing tree-cover destroyed during recent hostilities.

IRAN: (*11.12.1954*). One of a series of four stamps issued to commemorate the Fourth World Forestry Congress, held at Dehra Dun, India. The designs depict various forms of forest products utilization and types of equipment.

CANADA: (*1.4.1952*). Although not issued in connection with any specific forestry occasion, this stamp has as objective the arousing of an awareness, in Canadian public opinion, of the importance of forests and forest produce to the country's economic and social life. The design, a broad strip of wood shaped as a coniferous tree on the left, becomes a bleached curl of paper on the right. In the foreground is a pulp mill symbolizing the wealth of Canada's timber resources.

ISRAEL: (*22.9.1953*). Issued to commemorate the Conquest of the Desert Exhibition. The prophet Isaiah (35:1) said "The desert shall rejoice and blossom as the rose" and this symbolic rose forms part of the exhibition emblem.

During 1917-18 Lord Allenby, while his army was engaged on its conquering sweep across the Holy Land, inaugurated tree planting in the Plain of Esdraelon. The work was done by Arab villagers under the direction of British non-commissioned officers. From the end of the first world war to the foundation of Israel, the Jewish National Fund had 72 afforestation centers, covering 23,400 dunams, and it also restored some 40,000 dunams of neglected forest. To-day there are some 21 million trees in the Jewish National Fund forests in Israel.

SWITZERLAND: (*15.3.1954*). One stamp of a publicity issue advertizing the 11th National Agricultural, Horticultural and Forestry Exhibition held at Lucerne.

JAPAN: (*1.4.1948*). The Japanese have always been very tree-conscious, and a national tree festival is celebrated annually throughout the first week of April, known as Greening Week. This was first inaugurated in 1948, when this stamp was issued.

JAPAN: (*1.4.1949*). Issued at the beginning of the second annual celebration of Greening Week for the encouragement of afforestation. Since its inauguration, some 10,000 hectares have been reforested every year by high-school pupils as well as by children from elementary schools. In order to encourage this campaign, the Ministers of Agriculture and Forestry and of Education award prizes to the best schools in the school forest contest.

RYUKYU ISLANDS: (*18.2.1956*). Issued to commemorate Afforestation Week, the design indicates the place of tree-cover in mountainous country.

RYUKYU ISLANDS: (*19.2.1951*). The first stamp issued to commemorate Afforestation Week in the Islands.

FINLAND: (*15.6.1949*). On the occasion of the opening of the Third World Forestry Congress in Helsinki, two stamps were issued, one depicting the pulp and paper industry, and the other the Congress emblem, consisting of the world and a conifer.

NORWAY: (*15.6.1948*). Issued to commemorate the 50th anniversary of the Norwegian Forestry Society, and in favor of its founder, Axel Heilberg, born in 1848. This is believed to be the only postage stamp so far issued which portrays a forester. Sweden honored one of her sons, the naturalist Carl Linnaeus (1707-1778) or Carl von Linne (the name being derived from the Swedish word for the linden-tree), on a stamp issued on 2 June 1939 to commemorate the 200th Anniversary of the Swedish Academy of Science; but he was thus honored as the father of modern botany, not as a forester.

UNITED STATES OF AMERICA: (*22.4.1932*). Issued to commemorate the 60th Anniversary of the establishment of Arbor Day, first instituted by J. S. Morton in Nebraska on 10 April 1872. The observance of an Arbor Day has since become established in one form or another in all of the States. The date of observance varies greatly, however, because of the wide range in climate and the consequent differences in optimum planting time. Tree planting on Arbor Day is done largely by school children and combines pleasure with utility and instruction.

VENEZUELA: (*26.8.1950*). One of a very colorful set of nine stamps all portraying Venezuela's national tree, *Tabebuia chrysantha* (syn: *Bignonia chrysantha*, named after Abbé Bignon, 1626-1743, who was librarian to Louis XIV). A Resolution of 29 May 1948 jointly drawn up by the Ministries of Education and Agriculture, declared that *Tabebuia chrysantha* be the officially recognized national tree of Venezuela and was to figure as such in all studies on the country's flora. The tree, whose local name is Araguaney, in honour of J.E.V. Arago, 1790-1855, who accompanied De Freycinet on his 1817-1820 expedition, is 12 to 15 feet in height and bears a profusion of brilliant yellow flowers in May, when Venezuela celebrates its annual tree festival.

COLOMBIA: (*October 1949*). Issued to commemorate the First (National) Forestry Congress at Bogotá, held in October 1945.

PHILIPPINES: (*19.8.1952*). The stamp portrays Señora Aurora Quezon who was murdered by guerillas while she was on her way to attend a memorial ceremony at the birthplace of her late husband, Manuel Luis Quezon (1878-1944), first president of the Philippines from 1935 to 1944. A memorial in the form of annual awards to Filipino school children for the best tended fruit trees has now been established.

PHILIPPINES: (*14.4.1950*). Depicting the Red Lauan tree, the stamp was issued to commemorate the 15th Anniversary of the Forest Service. It must also have greatly encouraged the Philippine forest officers engaged in helping to heal the scars of war. Of the Red Lauan tree, Father Gaspar de San Agustin writes, in *Conquests of the Philippine Islands*, that the outside planks of the old Manila and Acapulco galleons were of lauan wood, which was chosen because it does not splinter with shot.

ITALY: (*21.11.1951*). Issued on the occasion of the first Festival of Trees to be celebrated under the legally sanctioned responsibility of the Ministry of Agriculture. The festival in Italy dates back to 21 November 1899 when it was first celebrated on the initiative of the Minister of Public Instruction. Its annual execution is now the responsibility of the State Forestry Corps, acting in co-operation with the Ministries of Education and Labor.

INDIA: (*11.12.1954*). The Fourth World Forestry Congress was held at the Forest Research Institute and Colleges, at Dehra Dun, India. The stamp illustrates the site of the Congress and was issued in connection with the meeting. The growth of the Institute has kept pace with the development of forest policy and timber utilization in India. Dehra Dun has been a center of forest education and research since 1878, when a Forestry School was established for the training of forest rangers. In 1906, a research department was added to the school and it was redesignated as the Imperial Forest Research Institute and College. In 1938, the Indian Forest College was established as an integral part of the Institute which, in 1951, was recognized by the Food and Agriculture Organization of the United Nations as a center for technical training in forestry for the Southeast Asian Region.

BRAZIL: (*30.9.1956*). One of the most recent stamps issued in connection with forestry, it marks the opening of the Forestry Education Campaign in Brazil.

ROMANIA: (*1.4.1954*). One of a second set of stamps issued to remind Romanians during the Month of the Forest, how much they owe to their forests and how essential it is to care for them. Half of the country is mountainous, the remainder consisting of the rich alluvial Danube basin, which is now largely deforested. The hill country was, until the 18th century, well wooded; but it then became sorely depleted to meet the needs of the Turkish markets. The wars of this century have made further inroads and some estimates now place the proportion of forest-covered land to total area as low as 10 percent.

ROMANIA: (*April 1955*). Wildlife (as illustrated), planting and rafting were the themes selected for the third annual series commemorating the Month of the Forest.

ROMANIA: (*20.8.1953*). One of three stamps of the first of an annual series issued in connection with the Month of the Forest. Whereas this one bears the slogan: " Forests near our fields, corn in our granaries ", the others illustrate the texts. " Re-establish the forests of our country " and: " The forests act as barriers against the fury of rivers and torrents."

ROMANIA: (*April 1956*). One of two stamps issued in connection with the annual celebration of the month of the Forest depicting felling, extraction and replanting.

NOTE: *For this information we are in large part indebted to Mr. A.C. Garrad, of the United Kingdom.*

(*Continued from page 72*)

This group held meetings in Italy and Switzerland in 1951 and recommended the setting up of an international commission on the same lines as the International Poplar Commission. This proposal was approved by the FAO Conference in the same year, and after the Director-General of FAO had consulted interested governments, the International Chestnut Commission was established in 1952.

Sessions have been held in Spain and Portugal in 1953, and in Italy in 1955. At first, prime attention was given to the diseases which had wiped out chestnut in the United States and threatened to do the same in Europe. Control methods were recommended, and then a more thorough investigation undertaken of distribution of resistant species and forms, optimum growing conditions, and the utilization of *Castanea* products. The Commission has now turned its attention to economic and social studies. Chestnut has been furnishing a means of livelihood for rural populations, especially in southern Europe: changes in rural economies threaten the continued existence of chestnut groves, and the Commission advocates the introduction of new patterns of land-use.

FIGURE 14. *Row plantations alongside canals and roads form a useful source of timber in many countries.* Populus deltoides (missouriensis) *put to such use in the Netherlands.*

Photograph: G. Houtzagers

Forest and Forest Products Research

The history of international co-operation in forestry may almost be said to begin in 1890 with the setting up of an International Association of Forest Research Institutes on the initiative of Scandinavian and German foresters. Several congresses were organized in the period up to 1910; in 1929, at Stockholm, the Association was reorganized as the International Union of Forest Research Organizations (IUFRO), a non-governmental body drawing its members from 21 countries.

The subsequent creation in Europe of the International Forestry Center (CIS) and the International Timber Committee (CIB) which were both in part concerned with forest research, led to a conflict of interests.

The second world war disorganized IUFRO, and the Interim Commission set up by the United Nations to prepare the future program of work of FAO recommended that the Union should be absorbed into the new organization, a recommendation which was approved by the first FAO Conference held in Quebec. After studying this proposition in more detail, it was felt that the matter merited further investigation, and preference was given rather to the establishment of good working relations between a re-established Union and the Forestry Division. An agreement along these lines was reached at a congress of the Union held in Zürich in 1948 and subsequently approved by the FAO Conference. By this agreement, the Union retained its independence, while its secretariat was provided by FAO.

This agreement, signed by the President of the Union and the Director-General of FAO in 1949, is still in force. In the meantime, the Union has been able to increase its membership from 59 institutes to 154, and considerably widen its range of influence (in 1949: 28 countries; in 1956: 50 countries). Valuable contacts and direct exchange of information have been secured between research workers and institutions.

At the same time FAO has been helping such countries as Austria, Burma, the Philippines, Mexico and Yugoslavia to organize and equip new national research institutes. Mention has already been made of the establishment of regional research centers in the Near East and in Latin America. Regional research committees are beginning to be activated within the Regional Forestry Commissions, and their relationships to IUFRO will be worked out in the light of experience. The Forestry Division's aim is co-ordinated progress in research and the best use of the still very limited funds available for research, especially in the underdeveloped parts of the world.

A joint FAO/IUFRO Committee on Bibliography was set up in 1949 under an independent chairman, Eino Saari, to assist both organizations in all matters relating to documentation. Its first task was to establish, based on a scheme put forward by the Commonwealth Forestry Bureau of Oxford, a new classification system for forestry literature to replace the Flury System which had become out of date. The result, the Oxford System of Decimal Classification for Forestry, has met with general approbation and is being progressively brought into use. The Committee is now, as is mentioned later, engaged in compiling a multilingual forest terminology.

World Forestry Congresses

Two world forestry congresses were held before FAO was set up, under the auspices of the old International Institute of Agriculture, one in Rome in 1926, and the other in Budapest in 1936. These congresses contributed considerably to broadening of horizons for foresters and to the establishment of fruitful contacts between individuals. Clearly such "world parliaments" would be of value to FAO and its Forestry Division, and therefore every assistance was subsequently given to the organizers of two further congresses in 1949 and 1954.

This will continue to be FAO's policy. The staff of the Forestry Division have frequent opportunities and occasions to come into close contacts with governmental representatives who may or may not also be foresters and technicians. These representatives, however, must voice official attitudes and policies. Gatherings such as world forestry congresses which are non-governmental in character and organized entirely by a host country enable FAO staff to "feel the pulse" of independent opinion and listen to individual views. This in turn enables the Organization to orient its action on a true picture of scientific and technical progress.

The function of these large meetings is to permit a general exchange of experience and knowledge about forestry which can serve as useful guide in applying forest policies.

When it is said that FAO gives its support to world forestry congresses, the Organization naturally endeavors to direct discussion to those topics that are of immediate concern to the further development of world forestry. At the Third Congress, held in Helsinki in 1949, attention was focussed on the methods that would give maximum efficiency to world action. The "principles of forest policy" have already been dealt with. The Congress also recommended that FAO undertake the compilation of a multilingual forest terminology so that the experts of many nationalities could understand exactly what was being talked about when problems were studied at the international level. A terminology of this sort is an arduous and long-term undertaking but the project is now well under way, under the guidance of the FAO/IUFRO Committee on Bibliography.

The theme of the Fourth World Forestry Congress, held at Dehra Dun in 1954, was the role and place of forested areas in the general land economy and economic development of a country. Special attention was given to tropical forestry since one of the present burning questions is precisely how to exploit tropical forests, so far of relatively little profit, to the advantage of national economies. With the approval of the FAO Conference the recommendations of the Congress have led the Forestry Division to concentrate action for the coming years, more particularly on the development of tropical forests, the increased use of tropical species and on problems such as watershed management.

The next World Forestry Congress is expected to take place in 1960. A decision as to the host country and program is expected this year.

Plantations of Fast-growing Species

From its inception the FAO Forestry Division has given much attention to the wide introduction of fast-growing species as an essential feature of policy. Quality may be sacrified for quantity but this must be viewed in the light of the development of chemical wood utilization, especially pulping.

Efforts so far have been concerned mostly with the use of selected seed and planting stock, selection or genetics, and publishing a "World Forest Planting Manual" in a series dealing with the various aspects of nursery and planting techniques throughout the world.

Among the recommended species, poplars have already been discussed in this paper. Much attention has also been given to the genus *Eucalyptus*. Its many species, adaptable to different ecological conditions or very easy to acclimatize, and the wide range of possible

FIGURE 15. *Libya. Eucalyptus are often planted as quick-yielding species. On the right, several* Eucalyptus gomphocephala, *20 years old. On the left, a* Eucalyptus rostrata.

Photograph: FAO

FIGURE 16. *Students on the Silviculture Study Tour organized in Czechoslovakia in 1956 listen to explanations by one of the tour directors.*

Photograph: Leibundgut

products, qualify eucalypts to rank in the fore of species for wide introduction as exotics.

Eucalypts can be used to some extent to improve the composition of existing growing-stocks: however, their primary use is in rehabilitating badly degraded forests where other silvicultural methods prove inadequate or in extending forests on denuded land in semi-arid and subtropical zones.

Another interesting aspect of the use of eucalypts is their value for shelterbelts and crop protection in semi-arid areas. Here, they also serve to yield a considerable supply of timber for local use, which contributes towards balanced farm economies and provides a cash income to peasant farmers.

The ready adaptability of various eucalypts has sometimes led users to believe that they could always find the species best suited for the purpose in view, but experience tends to show that there are limits. Rather, research and new techniques must reveal the best utilization practices. Then, eucalypts can play a much more important part in the economy of many countries.

A first requirement is an appreciation of the growth characteristics and of the properties of the wood produced under "exotic" conditions. FAO has endeavored to promote studies of this kind, and knowledge about cultivation methods.

First, a study tour was organized in 1952, under the Technical Assistance Program, to enable foresters to study eucalypts in their Australian habitat. Owing to the excellent preparation made by the authorities, this study tour was a great success and furnished the participants with a considerable fund of information.

Subsequently, a monograph was published entitled *Eucalypts for Planting*, and the three-language editions assured it a wide public; it constitutes a useful reference volume.

Then, to cap various other actions, a World Eucalyptus Conference was called at Rome in October 1956, when all problems from production to utilization were examined. 90 specialists from 26 countries discussed topics ranging from the introduction of new species under specific conditions, the management of the artificial plantations so established, to the better utilization of eucalypts products. Follow-up action on this conference will be undertaken in the future.

Study Tours and Training Centers

Study tours and training centers are a valuable means of international action, enabling technicians to study certain specific problems and become familiar with methods and practices perfected in particular countries. The lessons learned can be adapted to conditions in their own countries.

Under the Technical Assistance Program FAO has been able to organize a number of general study tours, some of a regional character. For instance, mention has already been made of the study tour on *forest fire control* arranged in the United States in 1951 and largely organized by the U.S. Forest Service. For five weeks 35 foresters from 23 countries were enabled to study and discuss in the field the fire prevention and control methods developed in the United States: forest fire behavior, detection methods, fire-hazard forecasting, types and utilization of fire-fighting equipment, and the training of personnel, were all amply demonstrated. Then in 1952 and 1953, 40 students selected from eleven Asian countries spent six months in the Philippines studying and practising mechanical logging methods, timber extraction and transport and, at the same time, the effect on silvicultural methods of mechanical operations in tropical forests.

The eucalypts study tour in Australia has already been noted.

In July 1956, 20 countries sent 35 foresters to observe the practices adopted in Czechoslovakia to convert extensive pure stands of conifers, mostly spruce, to mixed stands of conifers and hardwoods. The results of past monoculture were demonstrated and also the

FIGURE 17. *Students watching a demonstration of loading during the Far East Logging Training Center, organized by FAO in the Philippines.*

Photograph: H. G. Keith

importance of selecting species for planting programs according to local soil and climatic conditions.

Also in the summer of 1956, a study tour in the U.S.S.R. was organized by the Soviet Government to demonstrate the techniques and methods developed in Russia for shelterbelt planting and using tree plantations and woodlands to check erosion and protect farm crops, particularly in the arid areas of Uzbekistan. The participants were able to obtain a good general idea of the forest policy operative in the U.S.S.R. and of the administrative organization set up to implement this policy.

Better Utilization and Elimination of Waste

Much attention has been given at the international level to the many problems involved in reducing waste in the forest and in the factory; improving productivity by the use of modern techniques and machinery; improving the quality of consumer goods by taking advantage of technological advances, wood preservation, standardizing sizes and components, and proper grading. In this sector, the Forestry Division has called to its aid the members of two technical panels: one dealing with wood chemistry, and the other with mechanical wood technology, while in the matter of equipment, it has concentrated on assembling documentation on the new equipment and machinery produced. An Equipment Section is included as a regular feature in *Unasylva* and a series of *Equipment Notes* now enjoy a very wide distribution. Tractor catalogues have been issued, together with a technical bulletin entitled *Tractors for Logging*. Other papers have been published on the progress made in equipment for charcoal production and for the better use of wood as fuel for heating and cooking.

A joint FAO/ECE Committee has been concerned with improvements in logging and other forest operations and, with the International Labour Organisation, the training of forest workers, improved efficiency in performance and working techniques in the forest, the testing and use of equipment ranging from hand tools to mechanical saws and tractors.

FAO's technical panel on mechanical wood technology has advised the Organization in regard to improved machines and tools to increase production and reduce waste. Sponsored by the panel, three world conferences on wood technology have been organized, the last in Paris in 1954. The work of the members of the panel and the conferences have brought about general international agreement about standard tests and testing methods for determining the mechanical and physical properties of timber, of fibreboards and other wood-base products, and plywood and other glued veneer products.

Any discussion of reducing " waste " naturally leads to the problem of how it can usefully be utilized: in particular, small-sized or low quality wood, logging waste and slash can be used to make pulp; other waste can be converted by wood hydrolysis into valuable products. The wood chemistry panel has been of great assistance to FAO in assessing the economic possibilities of such operations.

Fibreboards and Particle Boards

An important industrial development within the joint competence of the wood chemistry panel and the mechanical wood technology panel is the manufacture of fibreboards, both hardboard and insulating board, and particle boards. This rapidly expanding field of utilization offers a most promising means of producing a wide range of products either from species of inferior grade or unused so far, or from various kinds of logging

or industrial waste. In fact, the fibreboard industry is one of the most striking developments in forest industries. Beginning about 1925, output before the war amounted to only a few hundred thousand tons, but has now risen to 3 million tons. Manufacture is economically feasible with fairly small plants, and therefore with relatively small capital. Also, it entails less technical skill than the more complex industries such as pulp and paper. It should therefore be especially suited to underdeveloped countries where high-grade building material could be produced locally by an industry using raw material of poor quality and hitherto of little value.

At a meeting of the technical panel on wood chemistry held in Israel in 1956, the basic chemical problems involved in the treatments the wood undergoes during fibreboard manufacture were considered. Then at the beginning of this year, an international consultation on hardboard, insulating board and particle board was held in Geneva. Preparations had been going on over a long time, both by FAO and ECE which shared in organizing the meeting; manufacturers, equipment suppliers, trade experts, economists, research workers and industrialists attended, altogether 330 participants from 36 different countries. The outcome will be a printed volume giving the results of the deliberations and forming a standard reference volume containing the best experience and technical knowledge currently available. Machinery will be set up to assure the regular international exchange of economic information and statistics useful for planning production and marketing policies.

Pulp and Paper

In helping the people of the world to better their standards of living, it is not enough to give them more and better food, clothing and housing; they must also be given education and information. In the world of today, more printing paper and newsprint are therefore essential.

Since paper is produced almost entirely from wood pulp, the Forestry Division has from the start given much attention to pulp and paper development which has recently ranked well to the fore in its program of work. A brief summary of its efforts in this field is worth recording because, at the same time, this represents an excellent example of co-operation between the United Nations itself and its Specialized Agencies.

As early as 1947, UNESCO publicly warned about the inadequate production and unequal distribution of wood pulp and its paper products. In 1949, FAO convened a preparatory conference on world pulp problems at Montreal with a view to ascertaining probable world requirements and production prospects in the future.

In 1951 there was a sharp rise in requirements: production of newsprint particularly was not sufficient to meet the high demand caused by stock-piling. Prices rose rapidly and, one after the other, countries reported the difficulty they had in providing for their essential needs: foremost among these countries, naturally, were those which had to import their supplies. UNESCO undertook a campaign to deal with this situation and received the support of the Economic and Social Council of the United Nations. ECOSOC appealed to all competent bodies and Specialized Agencies of the United Nations to start long-term action with a view to meeting the actual and potential demand of all countries.

The special contribution of FAO to this campaign, in which it closely co-operated with UNESCO, the United Nations and the International Bank for Reconstruction and Development, as well as the various regional Economic Commissions of the United Nations, consisted in:

1. sending on request survey teams to 24 countries with a view to determining, in consultation with the local authorities, to what extent the potential of raw materials and other factors of production would allow an expansion in pulp and paper production;
2. convening in Rome a meeting of internationally known specialists, and publishing their findings in the form of a study entitled *Raw Materials for More Paper*, incorporating the latest data on possible materials for pulp manufacture, and on processes;
3. publishing, in conjunction with the Economic Commission for Latin America, preliminary regional study on the *Possibilities for the Development of the Pulp and Paper Industry in Latin America;*
4. publishing, in co-operation with other agencies of the United Nations, a survey of *World Pulp and Paper Resources and Prospects;*
5. preparing, in co-operation with the Argentine Government, ECLA and the United Nations Technical Assistance Administration (UNTAA), a Latin-American meeting of pulp and paper experts, who closely examined the prospects for future development in that region as well as the technical and economic problems involved. The publication of the reports and documents submitted at this meeting brought into circulation a hitherto unknown mass of information of the greatest value in planning industries in underdeveloped countries;
6. establishing, again with ECLA and UNTAA, an advisory group in the Latin-American region for the purpose of advising governments and interested parties on the possibilities of implementing specific projects for new pulp and paper mills.

These are the salient features of the Forestry Division's performance in this field, but constitute only one part of its whole program. Systematic expansion of pulp and paper production is a long-term problem

FIGURE 18. *Canada is another great country whose economy and potential development rest considerably on its forest resources. Newsprint exports from Canada represent 80 percent of the world's total shipments. Canada was host to FAO's first conference on pulp and paper problems at Montreal in 1949.*

Photograph: National Film Board

and only sustained effort will bring results. Nearly all the aspects of FAO's forestry program can contribute directly or indirectly to its solution: statistical and economic data serve to fit the problem into the general scheme of things; forest inventories disclose potential resources; the dissemination of information on fast-growing species and non-wood resources stimulates higher production of raw materials for pulp and paper industries; the exchange of technical information on new pulping procedures makes for easier planning of new mills. FAO continues to give advice to individual countries through its Technical Assistance Program, and missions are, or have been, for example, operating in Honduras (for the Central American Republics), Indonesia, Mexico, the Philippines and Viet-Nam. Potential resources are beginning to be made usable as a result of research work revealed in the last few years.

It is obviously impossible at present to judge progress on what must be an extended program. However, the signs are encouraging. While, until 1950, pulp and paper production increased most rapidly in the already industrially developed countries, there is every reason to believe that in the last five years this disparity in progress has tended to disappear. Countries in the underdeveloped regions are beginning to realize the importance of the "glamor industry", pulp and paper, in well-balanced economic development programs.

Close co-operation between FAO and the other competent UN Agencies, is still the most effective means of promoting a development that will prevent shortage of paper from handicapping material, cultural and educational progress in the underdeveloped parts of the world.

Housing

In order to attain one of the aims of the United Nations, namely, the raising of living standards, the people of the world must be adequately housed. To some extent a solution of this problem rests with forestry, since in very many countries houses continue to be largely built or furnished with wood or forest-derived materials. Housing is a more acute problem in Asia than in other parts of the world, and as housing development plays such an important part in the economic and social plans of these countries, the Forestry Division has directed its activities in this field primarily to Asia. However, its actions have fallen woefully below what is required, but funds and staff cannot be stretched indefinitely. Co-operating with ECAFE and the regional housing research centers in Indonesia and India, the main questions under study at the moment are the technological characteristics of bamboo and construction timber available in the region, increasing durability and improving wood preservation methods, and the introduction of new sources and specifications of building materials. Experience has shown that many species not yet used for construction can quite well be substituted for more valuable woods and that, with suitable treatment, they can be made as durable and resistant as the traditionally-used timbers.

NATIONAL ACTION - DIRECT TECHNICAL ASSISTANCE

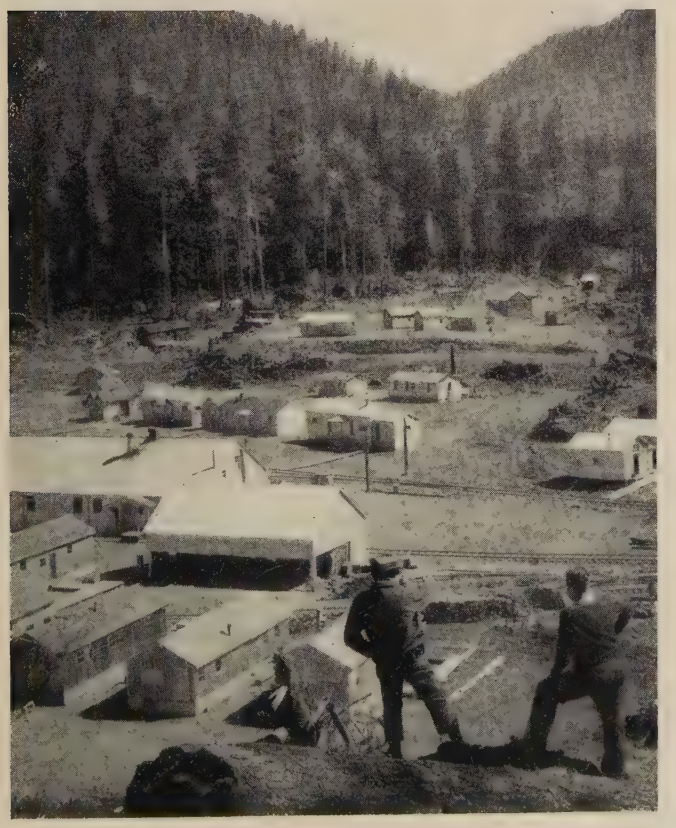
All international efforts are undertaken with the expectation of results that, more often than not, can appear only at the national level; the sum total of the individual or collective action achieved indicates the extent of the progress accomplished in the field of activity of the organization concerned. For a long time, the application at the national level of agreement arrived at internationally has been consistently opposed: when the second world war broke out, there was much talk of the failure of the League of Nations and international organizations in general.

The best technical — or even political — report is wasted if the governments and administrations to which it is addressed file it away instead of making the necessary effort to give effect to its conclusions. The most harmonized of international meetings is only a waste of time if its recommendations remain a dead letter. But this is exactly what has happened all the time, especially in the countries lacking the requisite knowledge, experts and equipment to derive benefit from international work.

Drawing on the lessons of the past, there has been introduced in the postwar period a new method of international action which may really be considered an outstanding contribution. It is called technical assistance, but it would be more exact to say "technical action at the national level" or "direct assistance" because a large part of the activities of an organization such as FAO, particularly in forestry, constitutes technical assistance, even if of an indirect sort. The technicians who attend FAO's various international meetings are informed of progress achieved in research and technical fields, and they have the opportunity to learn the measures taken by other countries to overcome difficulties similar to their own.

FIGURE 19. *FAO is concerned with improved living conditions for forest workers. A view of a well-spaced logging camp in the Olympic National Forest, Washington, U.S.A.*

Photograph: U.S. Forest Service



Experience has clearly shown, however, that this indirect technical assistance — in the form of meetings or publications — is not enough. It has to be supplemented by more direct action which must not, however, wound national susceptibilities or have "strings attached". The introduction of direct assistance has made this possible.

The idea of "technical assistance" is already implicit in the first article of the Constitution of FAO. However, in the early years of the Organization, budget limitations seldom allowed of applying the provisions of that article. It was only after President Truman had introduced his program of bilateral technical assistance popularly known as Point Four, that the United Nations and its specialized agencies — including FAO — began, in their turn, to put into effect a real program of international technical assistance on an extensive scale.

To-day, the technical assistance activities of the Forestry Division annually represent double the amount of its so-called "regular" budget. This regular budget is used to pay the salaries and travel of the permanent staff, and for organizing international meetings and issuing documentation and publications, but the technical assistance funds are reserved for furnishing specialists to countries which request their services, for granting Fellowships for the training of professional foresters and other technicians, for providing limited equipment for demonstration purposes, and lastly, to a minor degree, for organizing study tours and training centers.

Thus, FAO now has the means, intermediary between international and national action, of giving effect to the recommendations of the Regional Forestry Commissions and other meetings organized by the Forestry Division, of introducing modern concepts of silviculture, forest operations and industrial processing into less developed countries: in short, of ensuring the practical application of FAO forest policy.

In general, FAO technical assistance work can be divided into two broad categories: tackling the general problems of forestry and dealing with specific projects.

The formulation of policy or legislation, the establishment of an administration suited to the conditions of a country, these constitute the necessary basis for any subsequent action. A forest policy and forest laws cannot just grow from research and inventories alone;

the building-up of an efficient administration requires the training of personnel. It is easy to see, therefore, what technical assistance should deal with first. To pass over this stage directly to specific projects, such as the development of large-scale forest industries, is in our opinion a fundamental error that countries themselves end by regretting, as it may jeopardize the perpetuity of their forest resources. True enough, the prerequisites already exist in many countries and in others it is necessary to demonstrate that forestry pays and can yield revenue before forest management can have any reality. Still the approach must be cautious and grandiose or even petty failures avoided.

And here the Technical Assistance Program of the United Nations carries a defect which needs to be pointed out. The regulations governing this sector of our activities require that technical assistance shall be provided only as requested and in the form desired by the recipient country. It is thus hardly possible to influence forest policy in the directions which we consider sound if the country in question decides not to ask for assistance on this point; often, instead, FAO is called upon to furnish help in the improvement of sawmills — necessary, indeed, but surely of secondary importance when, for instance, there is no knowledge of the resource on which the sawmill must draw nor any efficient administration to plan or control the forest cut.

Of course, governments normally seek FAO's advice when requesting technical assistance, and in theory the Organization can reject any projects that appear to be unwise. Refusals of this kind are few because ineffective, as the project turned down by FAO may afterwards be sought from other agencies that furnish technical assistance or from other countries operating bilateral programs.

The experience of the last five years has also revealed other weak points in the Technical Assistance Program, due mostly to the fact that the programming and budgetary allocations are not in the hands of the same governing bodies and do not follow the same regulations as the regular program of FAO. Recently, an attempt has been made to merge the two programs within the administration and each Technical Division of FAO, and it is hoped that this integration will make it possible to shape technical assistance more effectively to the requirements of regional forest policies.

Notwithstanding, it is to be remembered that, since January 1952, the Forestry Division has filled 195 technical assistance assignments in 47 different countries, on projects of varying duration; organized 19 training centers or study tours; and awarded 124 Fellowships.

Forestry is said to be always slow in revealing results but FAO's Technical Assistance Program in forestry may fairly be described as already having yielded encouraging results. It would be beyond the scope of this article to analyze all the Forestry Division's technical assistance projects, but some samples may be of interest.

Latin America

Very rich in forest resources but still almost on the threshold of forest development, Latin America has always absorbed a large proportion of FAO's technical assistance in forestry. In 1957 it will take, in experts, Fellowships and equipment, some 40 percent of the total technical assistance budget of the Forestry Division.

At first, projects took the form mostly of advice on basic problems. For instance, in Chile, Paraguay, Colombia, Honduras and Mexico, the first task was to work out with the national authorities the broad lines of the forest policies to be pursued, and advise on redrafting the forest laws or re-organizing the administrative structure. Only afterwards did assistance branch out to more specific fields of action.

The largest forestry teams are now operating in Chile and in the Amazon Basin of Brazil and it is worthwhile examining the work being done in these countries in more detail.

Chile

In Chile, which is potentially a real "forestry country", the first objective was to assist in redefining the forest policy and strengthening the forest administration, tasks that require time and patience. A section in forestry development was incorporated into the International Bank's report on Chile's agricultural development. While continuing its efforts in these two directions, the FAO mission has also been engaged on other specific projects.

FAO experts helped to set up a school of forestry at the University of Santiago in 1953, to give university-level training for the first time in the country. Fellowships have been granted to the most deserving students so that they may specialize abroad.

At Llancacura, in the south of Chile, a training center has been established which includes a demonstration sawmill supplied from a forest reserve managed for this specific purpose. Although this center is not completely ideally located, students from the school of forestry and from industries can gain practical experience in forest operations, logging, and sawmilling. In the forest they can also be instructed in the fine points of forest research, practical silviculture work and systematic forest management. The director of this center, and the necessary equipment for the sawmill have been provided under the FAO Technical Assistance Program.

Continuing help and guidance has been given to private industries over the past five years, in close co-operation with the Development Corporation (*Corporación de Fomento*), and not least in the establishment of new pulp and paper industries based mainly on plantations of exotic pines and principally *Pinus radiata*.

Another assignment has been to advise on checking desert encroachment in the northern part of Chile and on creating plantations in semi-arid zones as an anti-erosion measure.

The Amazon Basin

This part of Brazil embraces 40 percent of the whole country and its 300 million hectares form the largest expanse of tropical forest in the world. The Amazon river flows over a distance of 2,500 kilometers, from the frontiers of Peru and Colombia to empty into the South Atlantic Ocean, and is fed by a maze of rivers and tributaries that traverse the gigantic forest.

Much more is known of this region and its natural resources than is commonly supposed, but its mineral, forest, agriculture and fisheries potentials have hardly been touched. The two million population represents less than 4 percent of the people of Brazil, and yet local agricultural production covers only half of its requirements.

Many have dreamed of opening up this area to development: now it affords a fine testing ground for the United Nations Technical Assistance Program and particularly for FAO's Forestry Division, which may fairly claim the credit for having actually initiated persistent action.

It took two years to unravel the complexity of the problem, but patient efforts were crowned with success: after the first technical assistance experts had got to work and the preliminary surveys and appraisals had been made, the Brazilian Government set up an Amazon Valley Economic Development Authority with an annual budget equivalent to 3 percent of the total federal revenue. As the first forestry team had requested, the FAO mission was expanded to include agricultural, livestock and fisheries specialists, and soil scientists appointed by UNESCO. The FAO mission has thus become a combined agency group, but as a tribute to the Forestry Division's initiative, the assignment of chief of mission continues to be entrusted to the head of the forestry team. The FAO mission now numbers 15, of whom seven are foresters, and the development and colonization plans are still based on the systematic exploitation of the forest resources.

There are three main lines of approach in the forestry sector:

1. Inventory of the growing stock, essential to all forward planning. Three areas were selected from a careful interpretation of available aerial photographs. The first lay south of the Amazon between the Tapajoz and Xingú rivers: by sampling methods an inventory was made of 2 million hectares and the necessary maps compiled. Work has now moved to the second area, also south of the Amazon and between the Xingú and Tocantins rivers. The third region, in the drainage area of the Madeira river south of Manaus, was chosen because the Government is interested in developing a pulp and paper industry there.
2. Organization of a demonstration logging and sawmilling center at Santarém. Present methods of logging and milling are so wasteful that it was decided to create a center, with the necessary equipment, where foremen and forest workers could be instructed and trained in more efficient operational methods both in the forest and in the sawmill.
3. The gradual evolution of a center for forest and forest products research at Manaus based on the *Instituto de Pesquisas de Amazonia* (Amazonia Research Institute). The aim is to collate information on the more important of the 1,500 odd forest species, their ecological requirements, growth and silvicultural treatment, and eventually to training silviculturists and research workers.

Asia and the Far East

In the Far East, most countries are relatively advanced in technical development: they have organized forest services and, as has been pointed out earlier, are well ahead in the formulation of forest policy. Still, for some of them, the change from a dependent status to complete independence caused difficulties when expatriate staffs who had held high executive posts, withdrew.

In Indonesia, Pakistan, the Philippines, Thailand and Viet-Nam, policy missions have advised on forestry in relation to economic development, followed by specific assignments on, for instance, forest inventories, industrial plantations, or sawmill industries.

Figure 20. *An FAO expert has been working for some time in Indonesia, and advising on the creation of new forest industries as an integral part of the national development plan.* Pinus merkusii *plantations might serve to provide the raw material for pulp and paper.*
Photograph: S. Bunnag

As early as 1951, Burma asked for help in planning a considerable expansion of forest operations and industries. Tests were carried out to determine the suitability of secondary species for the manufacture of fibreboard and particle board for mass housing. A pilot plant for wood impregnation was built and its operation initiated by an FAO technician. Two other experts have assisted in planning a new institute for forest and forest products research. Twelve Fellowships have been granted to Burmans for advanced training in special fields of work.

In India, many assignments have been carried out, covering ten separate fields of activity. An interesting project concerned control of arid areas in Rajasthan and measures to check desert encroachment.

Among technical assistance projects of regional interest, mention may again be made of the eucalyptus study tour in Australia, and the mechanical logging training center in the Philippines. There has also been the seminar for forest research workers organized in India, and a timber grading course in Malaya.

Near East

The forestry situation in the Near East has been described earlier in this article, and the difficulties which the region poses for forestry development. But in practically every country of the region, a good start has been made with technical assistance activities.

For the last four years, FAO has maintained a forestry adviser in Ethiopia to help the Government to organize a forest service, draw up appropriate forest legislation, and encourage more extensive utilization of the forest resources or widen planting programs. Several students have been sent for training in forestry in Australia.

In Iraq, there is also a general forestry adviser who has a variety of functions to perform. Other officers have been concerned with making an inventory of the forests in the north from aerial photographs, organizing a program of research work, and with the cultivation of eucalypts and poplars.

With financial assistance under the United States foreign aid program, Iran has created a modern timber research laboratory. FAO technicians helped install the equipment, initiate research work and train personnel. A team of five is now continuing the earlier work of other FAO experts on forest management and forest range management, logging and forest operations, and utilization. Special attention is being given to poplar growing.

In Jordan, an ecological survey of the vegetation has been carried out to provide a basis for planting and reforestation projects, while in Libya, a general investigation of forestry potentialities, especially for sand-dune fixation, was made in 1951. A forestry adviser continues to be maintained at the service of the Government. Syria has had several projects concerned with the inventory, demarcation and management of the existing forests.

One might regard the Yemen as an unlikely ground for technical assistance in forestry but an evaluation of the situation has been carried out in the course of a general FAO survey. Saudi Arabia may draw on FAO's help in tree planting in the future.

Since progress will largely depend on the provision of trained personnel, FAO has paid particular attention to technical education, mainly by granting Fellowships; there is a regional project to create a school for training forest rangers, the instruction to be in Arabic. A technical director has been appointed for a Near East research center, and he is now touring countries of the region to discuss research programs and needs.

Europe

Europe is rather a furnisher of experts than a recipient of help through technical assistance programs. Nevertheless, both under bilateral and UN programs, many countries have been interested in getting advice in particular fields. Iceland, Greece and Malta may be cited. But most technical assistance work has been concentrated in Austria, Yugoslavia and Turkey.

Work in Austria started under FAO's regular program and help was given in formulating a comprehensive program for the development and rehabilitation of the forests and forest industries, which suffered severely during the war. Thanks to international financial assistance, it has been possible to implement this program to the full. Help has also been rendered in organizing and equipping a sawmilling training school and establishing a research institute.

In Turkey, the FAO forestry team has been the largest technical assistance group operating, and efforts are now being concentrated on managing and operating selected forest areas to demonstrate all the phases of research, silvicultural methods, logging and extraction, and training of forest workers.

The case of Yugoslavia illustrates how the Forestry Division likes to balance its technical assistance work between the general and the particular. Forestry ranks high in the economy of this federal country. One third of it, over 8 ½ million hectares, is under forest which supplies the raw material for a large number of forest industries: Yugoslavia is one of the main exporters of timber in the European region. The Government has, therefore, had good grounds for special concern over the conservation, management and utilization of this natural resource.

Yugoslavia has sought the services of a number of experts on fairly short missions to advise in the following fields: soil conservation, torrent control and watershed management, reforestation, improvement of forest stands, genetics, research on forest products, timber extraction, sawmill industries, artificial timber seasoning, veneer and plywood industries, and utilization of "waste" for the pulp and paper industry. At the same time, Fellowships for training abroad have been granted in most of these fields.

An adviser on forest policy was also called in. After four years it was clear, both to the Yugoslav author-

FIGURE 21. *A Canadian expert has advised on sawmill techniques in the Sudan. This photograph shows the laborious cross-cutting and handling of railway sleepers in a pit-sawing camp in the Bhar-el-Ghazal Province.*

Photograph: V. Hasek

ities and to FAO's Forestry Division, that the time was ripe to co-ordinate all these apparently dispersed efforts. A meeting was held in Dubrovnik in 1954 which was attended by as many as possible of the foreign specialists who had served in the country, Yugoslav forest authorities, and by representatives of FAO. The result was a five-year plan for increased forest production and the co-ordination of the forest policies of the various constituent republics of Yugoslavia.

COLLECTION AND DISSEMINATION OF INFORMATION

This is a basic function of all international work and the purpose is to pass on to member countries the benefit of the vast amount of information of all kinds that reaches the Forestry Division from many sources. This also is a form of technical assistance.

Anyone who has kept abreast of the work of the Forestry Division must already be aware of its many publications. It is unnecessary to catalogue them here but something may be said about the purpose of the publications that are issued.

First come the economic and statistical publications constituting what may be called an "intelligence service" — the yearbooks of forest products statistics and periodic volumes on forest resources, intended to supply basic and timely information for Regional Forestry Commissions, technical assistance missions, and national administrations and private industry.

The second category comprises "analytical" publications that disseminate information useful to forestry development in the widest sense of the term. Under this heading should be classified titles issued in the series of "Development Papers"; such publications as *Research in Forestry and Forest Products*, the *Directory of Wheel and Track-type Tractors*, or *Forestry Abstracts Coverage List;* the *Equipment Notes;* and, notably, *Unasylva* itself which is published quarterly in three languages. *Unasylva* attempts to cover a range of interest as wide as that of the Forestry Division whose work it mirrors. It is designed to advance public understanding of all aspects of FAO's forestry activities.

The third category is the most important, not for the number of publications issued but because of the influence they are expected to exert. These are the "synthetical" studies. In fact, this kind of study is the quickest means of supplying the Regional Forestry Commissions and interested technicians with the aggregate result of the analyses made either by the Forestry Division itself, which in this respect disposes of better sources of information than any other agency, or by specially engaged consultants of known repute. Original research work must remain the responsibility of governmental or private institutions or individuals; but an international organization like FAO is particularly well-qualified to analyse the developments reported to it. The conclusions of such studies, although they only commit the secretariat of the Organization, in the name of the Director-General, carry sufficient weight to receive notice directly at the government level; other methods at the disposal of the Forestry Division entail a long wait before action is likely to be taken. Results obtained through these studies have proved their efficacy, and into this category are put such titles as: *Planning a National Forest Inventory, Forest Policy, Law and Administration, Elements of Forest Fire Control, Grazing and Forest Economy*, and *European Timber Trends and Prospects.*

ORGANIZATION AND WORKING METHODS

The Forestry Division was established on 1 May 1946 with the appointment of its Director, whose initial task was to recruit and bring together the first nucleus of a staff. At the same time, it was necessary to establish a practical program of work within the means at FAO's disposal, to determine working methods and develop action on the instructions and directives given the Division by the FAO Conference at Quebec. This could, clearly, not be settled all at once. The organization of the Forestry Division is a progressive task, every year some adjustments have to be made, work has to be oriented in line with new directives, methods have to be improved and their efficiency increased.

At the time of writing, the Division consists of 37 professional officers and is organized as follows.

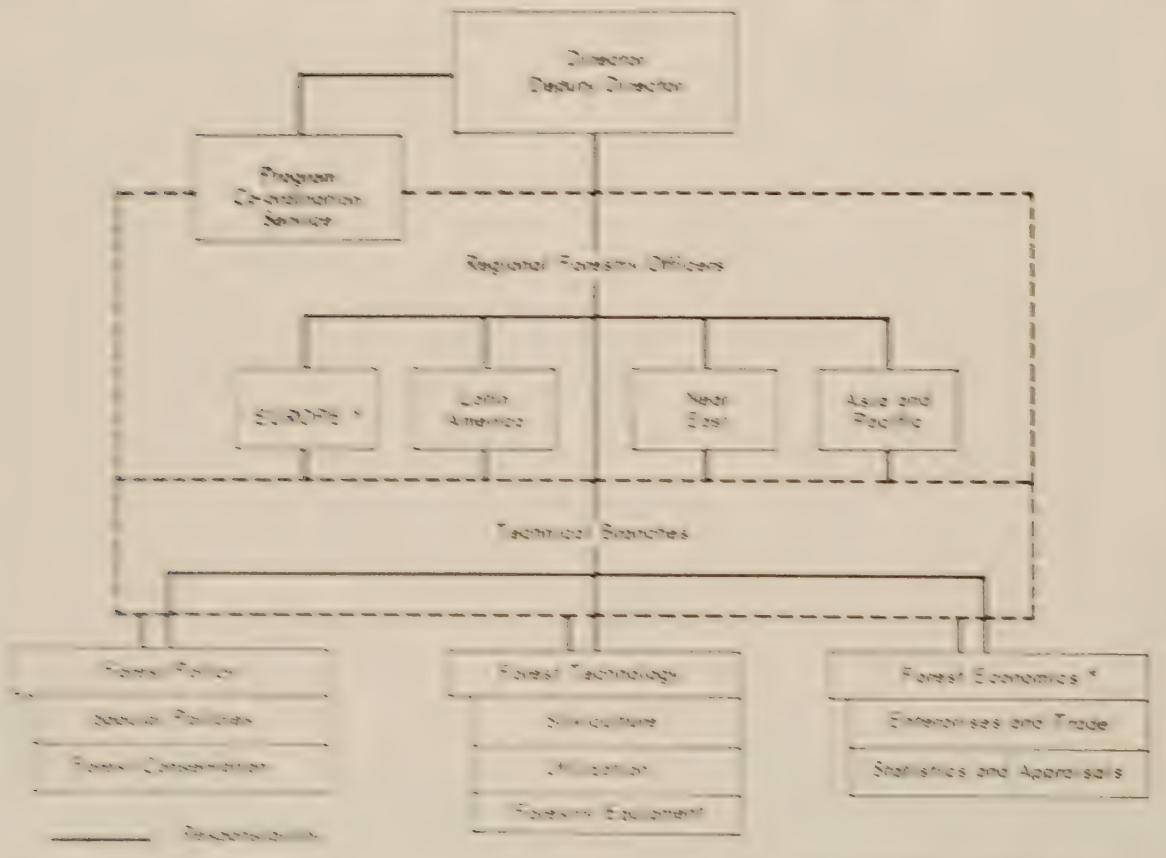
The Director and Deputy Director of the Division are assisted by a Program Co-ordination Service in planning and operating programs of work and budgets, and in the administration of all forestry activities.

As will have been realized, each activity of the Division usually involves at one time closely linked aspects of policy, technology and economics. It is on this basis that the Division has been divided into three Branches. But although a specific Branch may be accorded primary responsibility for carrying out certain activities, in practice the latter involve the teamwork of the entire Division under the direction of its Director and Deputy Director.

The first Branch is concerned with forest policy and conservation: it is divided into a special forest policies section which deals with particular forestry development projects, administration and education, and another section for forest, soil and water conservation problems.

The second Branch, forest technology, is composed of three sections: silviculture, for all questions relating to forest protection, treatment and management, and the basic sciences; utilization, for all phases that

FORESTRY DIVISION, ORGANIZATIONAL STRUCTURE



* Forest Economics Branch provides staff for Forestry Working Group at Geneva

may be included under this heading; and forestry equipment, which cuts across the interests of the entire Division.

The third Branch, that of forest economics, is concerned with the economic aspects of forest production, forest management and the utilization and distribution of forest products. It comprises an enterprises and trade section and a statistics and appraisals section, both of which work closely together.

As has been seen, the greater part of the practical work of the Division carries its impact at the regional or national level: consequently, regional forestry and forest products working groups have been organized for Europe, Latin America, Asia and the Pacific, and the Near East: for the last three regions the groups operate under a Regional Forestry Officer who is organizationally attached to the office of the Director. In addition to his liaison functions, the Regional Forestry Officer is charged with seeing that application is given to the recommendations of the respective Regional Forestry Commission and of technical assistance officers.

The regions to which no staff member has as yet been outposted are serviced directly by Headquarters, as, for example, Africa south of the Sahara, and North America.

Up to early 1956, the Technical Assistance Program was handled by a separate operational unit although, from the technical standpoint, it naturally took up a considerable amount of the time of the other staff of the Division. In 1956, on the direction of the FAO Conference, the Director-General took steps to integrate the two programs (regular and technical assistance). Accordingly, the unit which had previously dealt with technical assistance was abolished and its functions were divided between the Program Co-ordination Service and the three technical Branches of the Division.

Administratively, the main problem of the Forestry Division has always been the steadily mounting number of tasks that it is called upon to perform with the very limited number of professional officers available. Restricted funds and personnel has led the Division to seek all means of assistance likely to help in its work, including the maximum possible voluntary co-operation of outside experts and other organizations. The response has been most gratifying, and in many fields of work has substantially lightened the burden of the secretariat.

Outside FAO, the Forestry Division endeavors to co-operate to the full with other international and national bodies working in the same field. Likewise, inside the Organization, it co-operates with the other Technical Divisions to the greatest extent possible, both in the regions and at Headquarters. Obviously, some activities, as, for instance, soil and water conservation or watershed management, demand such handling.

The Director of the Division and his Deputy are directly responsible to the Director-General for the policy of the Forestry Division as a whole and for the performance of the tasks entrusted to the Organization by the FAO Conference.

CONCLUSIONS

The foregoing pages describe, in broad outline, what the approach of the FAO Forestry Division has been to world forestry problems, how an organization has been systematically built up to carry out the tasks entrusted to FAO, the methods employed, and some of the highlights of what has been accomplished in the various fields falling within FAO's province.

To conclude, it may be worth re-emphasizing certain points.

* * *

Two important concepts have been the basis of the Division's work:

First, improving yields from natural renewable resources is a main objective of FAO. It involves essentially the rational use of land and soils — and, consequentially, of the water of which soils are the source and reservoir. By rational use is meant the maximum utilization compatible with soil conservation and maintenance of soil fertility.

It is recognized by the experts, especially those who have to plan land-use in watershed areas, that, however different may be the most appropriate uses, soils are interdependent. A balance between their different forms of use is essential, not only from the economic but even more so from the physical standpoint. It is certainly highly important to secure the maximum yield from each type of land: this is a matter of research and techniques. But behind that there must be policy in regard to the distribution of land among the various possible uses.

The different aspects of the conservation of natural resources were discussed during the Fourth World Forestry Congress at Dehra Dun. The attention of all governments was called to the close interdependence between agriculture, grazing, and forests, and the bearing of this on man's economic life.

Second, the science or practice of forestry is not an end in itself. This has always been kept to the fore by the Forestry Division and was recognized by

the Third World Forestry Congress at Helsinki. Each forest as an entity and even, it may be said, each individual woodland, is associated with a complex of physical, economic, and social factors, so interconnected that none can be considered in disregard of the forest and, inversely, the forest cannot be considered in disregard of the other factors.

Where there is a social problem relating to forest workers; a physical problem of the protective functions of the forest in relation to rural or urban populations; or problems of the economy of a region or just of one ordinary village — the forest management cannot stand aside in splendid ignorance.

There has been much progress in thinking on this point, and it is now generally acknowledged that the forest cannot be dissociated from the industries it feeds. The forester has to adjust his silvicultural methods to the needs of industry or even local consumption: conversely, industry must through research and experiment seek to utilize the raw materials which the forest can provide.

* * *

The reader has noted the objective laid down for the FAO Forestry Division — " to supply an expanding world economy with the forest products it needs ". He will readily ask, is this capable of realization?

The last world forest inventory taken by FAO gives one answer: the world's forests are theoretically adequate for a consumption of wood much greater than at present, and can also amply meet the needs of a steadily increasing world population.

The forests of the world cover nearly 4,000 million hectares of which less than one-third is in use. Immense reserves are still untouched and of these 700 million hectares are immediately accessible.

For the world as a whole, removals from the forest represent only one half of the annual growth of the forests now being worked. True, in coniferous forests, fellings and losses approximately balance growth, but broadleaved forests are underexploited.

The big qualification, of course, is that forests managed for sustained yield are still, on an area basis, the exception, and exploitation methods are satisfactory in only a relatively small number of countries.

If all existing forests were brought under systematic management, if the accessible forests at present unproductive were put into use, if the entire forest output were efficiently utilized, it would be possible to increase world production of wood threefold, while still maintaining the principle of sustained-yield. To this could be added the output of new man-made forests that are being widely established in many countries.

It is plain, therefore, that it is not lack of raw material that can prevent the forest from contributing substantially to an expanding world economy.

* * *

In regard to levels of wood consumption, the decisive factor is undoubtedly what forest resources a country has. It is not possible to demonstrate any direct correlation between demand for wood and standards of living, but it must not thereby be concluded that there is no such correlation; the assumption must be that wood consumption will increase as living standards rise.

Although probably future trends in wood demand and consumer use can only be adjudged after a careful analysis of the present pattern of use in the various regions, investigations which the Forestry Division has already made, make it safe to say that:

1. The present trends in world economy will bring about a rise in the demand for industrial wood.
2. This increase will be most marked in the underdeveloped countries.
3. The increase will be higher in the pulp sector than for other forest products.

To meet the increase in requirements, reliance cannot be placed on savings resulting from a marked decline in fuelwood consumption.

Foresters must, therefore, already plan for a systematic increase in the annual cut of industrial wood. They must also take into account the enormous technical progress that already has been, and will continue to be made in the wood-using industries, both chemical and mechanical.

It is in this sense, expansion of output and changes in rotation, that forest policy will have to be modified.

The prospect makes it possible to envisage a more rapid utilization of tropical hardwood forests. But here more than anywhere else, while developing forest production and adapting it to requirements, foresters will have to keep in mind the protective function of the forest which in many cases is more important than the production potential.

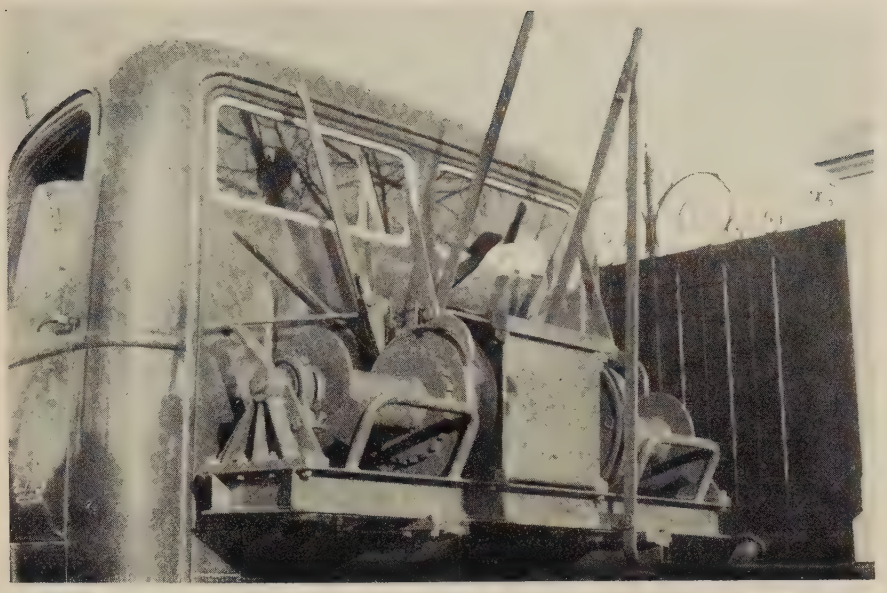
* * *

The work carried out by FAO with the help of national forest services and industry is beginning to produce results: many examples have been given in this article. But, in forestry, results are slow to appear and continuity of action is more necessary than in most other fields. In the ten years which have now ended it has only generally been possible to define the problems and to outline solutions. It is important to continue this work for the greater benefit of the peoples of the world.

Equipment Section

Spray Nozzle HWA-602. — Spray used for marking bands on or around trees or other objects with paint, or for making letters or symbols. From distance of 2 in. (5.08 cm.) makes band of paint approximately 1 in. (2.54 cm.) wide. Width of band increases to approx. 3 in. (7.62 cm.) when applied from distance of 4 in. (9.16 cm.).

The Nelson Company, Iron Mountain, Michigan, U.S.A.

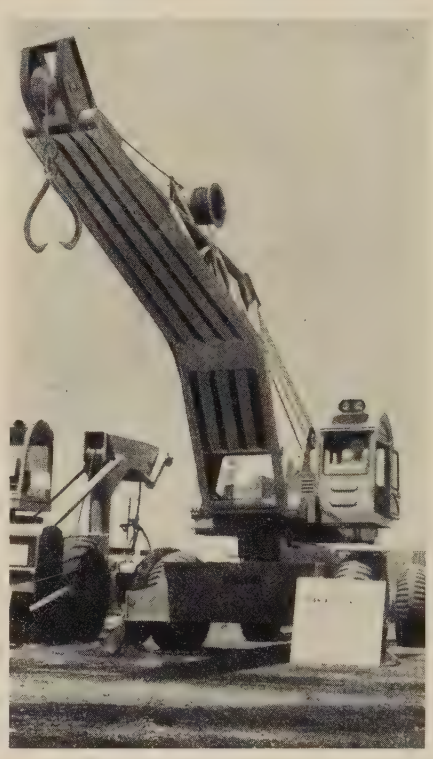


Mechanical Winch for Loading Logs. — Driven either by power take-off of vehicle or by auxiliary engine. Double-drum type with differential. Both rope drums can be rotated simultaneously, or either drum stopped at will. Worked by two control levers without disconnecting drive. Rope speed controlled by pedal operating on lorry accelerator. When equipped with auxiliary engine, acceleration is automatic. Safety catch keeps load steady during hoisting. All metal, electrically welded stanchions, folding in 3 sections, oscillating and removable rollers allow loading and unloading on right or left, without rotating bolster.

Telescoping stanchions – length increased in proportion to load.

Minimum space occupied 40 cm. (15 3/4 in.) behind cab.

Les Etablissements L. Fournier, Constructions Mécaniques, Ambert (Puy-de-Dôme), France.



All-electric Log Loader. — Has powered outriggers, controlled by simple switch within cab, saving much time formerly required for setting up and leaving job.

DC-powered hoist and swing design provides exact speed and power with infinitely controlled "spotting" action.

Extreme mobility and traction for operation in all weather; adequate speed for road travel between jobs. Loading capacity 25 tons.

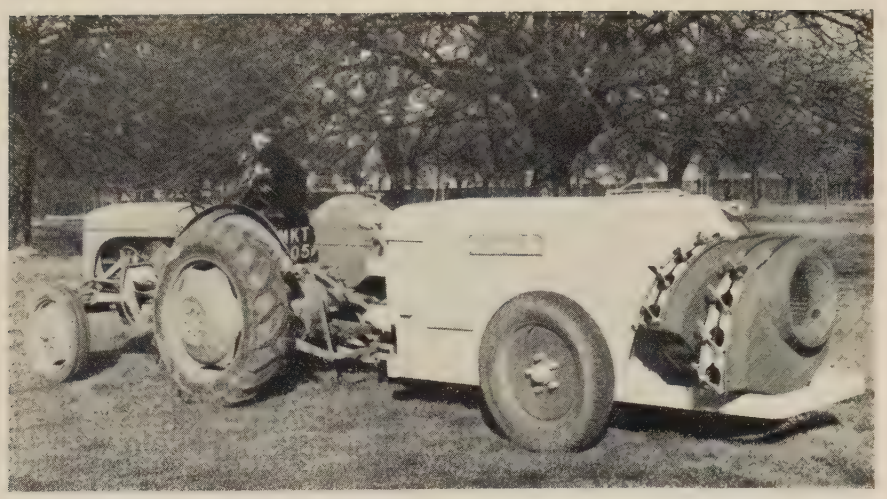
R. G. Le Tourneau Inc., Longview, Texas, U.S.A.

Hudson Simplex Inner-seal Compression Sprayers. — Sprayers have unique type cover and seal that seals from within tank. Air is forced into tank by hand pump, pressure in tank forces cover upward, causing cover gasket to compress. The greater the pressure in tank, the tighter the seal. Pump is mounted separately in sprayer top and need not be removed during normal operation. Hand control valve can be rotated 360° at mid-point enabling all-direction spraying at nozzle end.

Spray extension 24 in. (60 cm.) long.

Specifications: In 4 and 3 ½ gal. (15 and 13 ¼ l.) capacities, withstands internal pressures of 90 to 100 psi (6.3 to 7 kg/cm²). 4 gal. (15 l.) tank 22 in. (56 cm.) high; 3 ½ gal. (13 ¼ l.) 19 ½ in. (50 cm.) high; 7 ½ in. (19 cm.) diam.

H. D. Hudson Manufacturing Company, 589 East Illinois Street, Chicago 11, Illinois, U.S.A.



Penetratior Sprayer and Mistblower. — Designed to spray by air atomization, with air as carrying medium, giving penetrating cloud of fine droplets of concentrate solutions. Airstream created by twin fans directed to exact position to cover trees perfectly. Tractor driver does this from seat of machine under way; can also turn whole fan assembly to opposite side to take full advantage of natural air currents.

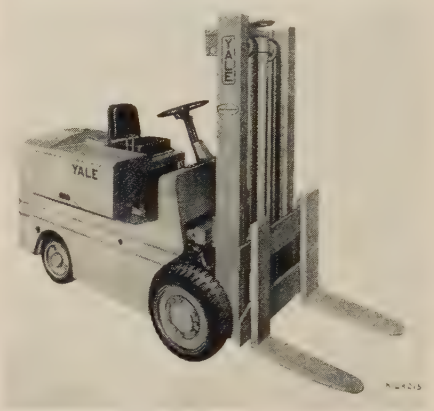
Spray nozzles situated in airstreams fed from pump driven from tractor p.t.o. shaft, or its own engine. Volume sprayed per acre adjusted by simple changing of nozzle discs to give from 250 to 20 gal. (6,177 to 222 lit. per ha.).

Hp absorbed by fan 12.5 hp (approx) giving 13,500 cu. ft. (382.05 cu.m) per minute at approx. 100 mph (160 km/h). Centrifugal type pump gives pressure of 40 lb. per sq. in. (2.8 kg. p.s.cm.). In four models.

Kent Engineering and Foundry Ltd., Phoenix Works, Tovil, Maidstone, Kent, U.K.

Yale Truck KGA51. — Yale KGA51 series of trucks with fully automatic torque transmission which eliminates manual gear shifting. For gas, LPG and diesel powered industrial lift trucks. Built in capacities from 3,000 to 8,000 lb. (1,360 to 3,630 kg.). Oil pump, equipped with relief valve externally mounted for easy access. Whole transmission unit removable without disassembly. Clutch discs can be replaced without removing major components. Dependable transmission cooling assured.

Yale and Towne Manuf. Co., Philadelphia 15, U.S.A.



Pulpwood Loader. — An attachment for Hyster model lift trucks designed specifically for unloading trucks, storing pulpwood in yards and loading on to railroad rack cars. Mobility of trucks permits fast handling. *Features*: all weather traction, rough ground operation, hydraulic power trip, large rugged bumping plate. Capacity rating varies with each model lift truck and length of reach desired. When attached to most powerful model it can transport up to 1 ½ cords (approx. 4 m³). Equipped with load and side rollers and lead cables with special hook.

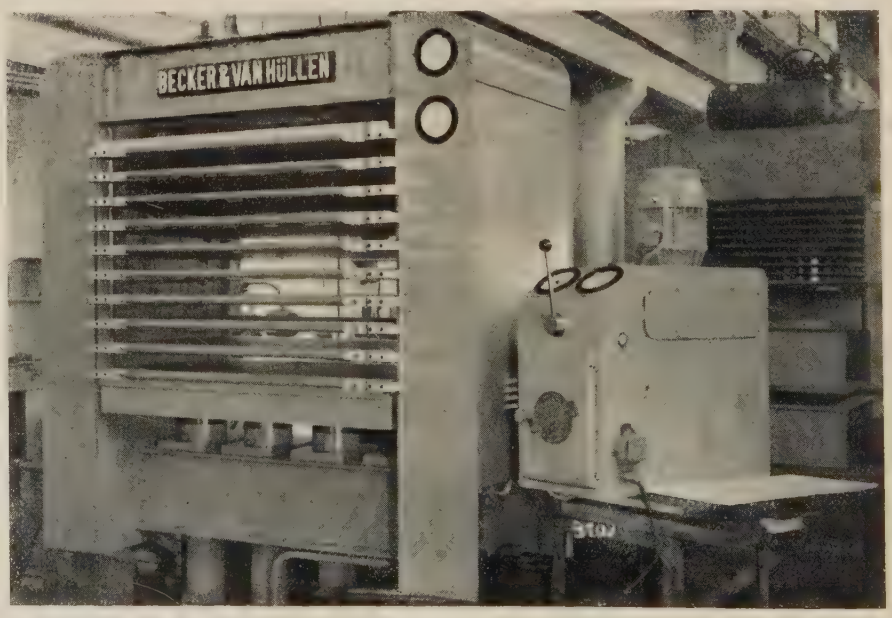
Hyster Co., Portland, Oregon, U.S.A.

Hydraulic Veneer and Plywood Press Type DFPO. — Hydraulic drive located at side of press, incorporates hydraulic multi-piston pump, flange mounted motor, electro-hydraulic control elements and fingertip-control operating lever.

Press closed by full output of gear pump at speed of up to 1 ½ in. per sec. (37 mm. per sec.). High-pressure pump brought into operation automatically on completion of closing movement. Pump discharges oil until desired pressure (pre-selected by means of contact pressure gauge) has been attained. Motor then automatically switched-off. Pump re-starts automatically if pressure drops due to resilience in material being treated.

Platens can be heated with steam, hot water or by special oil. Driving motor approx. 15 hp. with switch. Standard range covers pressures from 160 to 1,000 tons and panel sizes up to 100 × 62 in. (2,540 × 1,600 mm.).

Becker and Van Hüllen, Niederrheinische Maschinenfabrik, Krefeld, Germany.



FAO accepts no responsibility for the claims of manufacturers

News of the World

Australia

• A newspaper source says that the discovery of methods of extracting hyoscine and atropine from a common bush shrub has turned Australia into one of the world's major sources of these drugs. Quantities of them are now being extracted commercially.

The shrub is duboisia, which grows wild in many parts of Australia. Hyoscine is used for inducing "twilight sleep" and atrophine for dilating the pupils in eye operations.

Scientists have also perfected a method of extracting the cough medicine ingredients, menthol and thymol, from Australian eucalyptus trees. Other substances found in Australian gums are the drug rutin, used for breaking blood clots, and ascutin, a sun-tan lotion constituent.

• An official report to FAO states that most State forest services are pursuing an active policy of increasing the forest estate by the acquisition of suitable Crown land and, in some cases, the purchase of private property. The decision to acquire land for forest purposes is usually taken only after agreement with the State Lands Department on land utilization classification. During the last two years there has been an increase of nearly one million acres (404,700 ha.) in the area of dedicated forest, and of about a quarter of a million acres (101,170 ha.) in timber and other reserves. A general principle which has developed in connection with land-use planning is that Crown land is not alienated without reference to the Forest Authority, nor without the prior harvesting of any merchantable timber crop thereon.

There is a distinct trend towards the dedication of any timber reserves which may be suitable for permanent forest management. In some of the present inaccessible forest areas of Tasmania, the making of new roads is planned to serve the combined purposes of forest management and mineral prospecting and development, as well as the construction of a series of hydroelectric power stations.

• On page 141 of Volume 10, No. 3, of *Unasylva*, an item gives the botanical name of paperbark as *E. fitzgeraldi*. In fact, the paperbark of the Northern Territory is not a eucalypt but is *Melaleuca leucadendron*.

Burma

• A government report states that the Shan States Soil Conservation Department continues its activities. Eight soil conservation demonstration centers are in operation in these hill areas for experiments on contour cultivation, contour cropping, strip cropping, crop rotation, terracing, maintenance of terraces and waterways, gully control and afforestation. Besides these regular operations in demonstration centers, technical assistance is also given to cultivators in their own fields on soil conservation works and also in techniques of planting and afforestation. Work is also in progress to protect and improve water springs and catchment areas at seven reservoirs.

Rehabilitation of reserved forests in the plains of Burma, severely damaged during the war and subsequent insurrection, is being continued in localities where conditions permit. This field will be one of the major operations of the Forest Department. Roughly about 75 percent of the reserved forests in the "local supply working circles" require to be rehabilitated. As rehabilitation in the quickest possible time is imperative, an unprecedented area of about 2,000 acres (810 ha.) will require to be regenerated yearly in each forest division compared with the normal annual acreage of 300 to 400 acres (120 to 160 ha.). These reserves are the most important and accessible forest areas to meet the demands of the heavily populated tracts for firewood, poles, house-posts and small saw timber.

The work under the afforestation scheme in the Dry Zone aims at the formation of productive forests for domestic consumption and protective forests to check the deterioration of the soil by erosion and lowering of the water level. The work is undertaken by the Agriculture and Rural Development Corporation with seconded personnel of the Forest Department whose work is made easier by the close co-operation given by the territorial staffs of the Forest Department.

In the Dry Zone, up to 1956, the following areas have been afforested:

	acres	*hectares*
Village forests	3,456	(1,399)
Demonstration areas	1,917	(776)
TOTAL	5,373	(2,175)

On the slopes of Mount Popa which has an elevation of 5,000 ft. (1,524 m.) where most of the large streams of the Dry Zone have their sources, the past practice of shifting cultivation to form banana plantations has resulted in advanced erosion and lowering of the water table and reduction of active springs from nearly a hundred to about a dozen.

Afforestation work is being carried out in the Popa Reserve; and in the unclassified forests on the lower fertile slopes, coffee plantations of about 20 acres (8 ha.) have been established to serve as a demonstration area to encourage the local people to supplement their low incomes. This afforestation-cum-coffee-planting has been adopted as an experiment to combat shifting cultivation practices in many other hill areas.

Canada

• Forest site classification by relating the forest to the associated plant communities has been used in European countries for a long time, and has also been developed in the Province of Quebec, Canada. The method has also been carried to the

Associations	Site type	Site class
Balsam Fir		
1. Associated with herbs and ferms	Dry-0	I
2. Associated with mosses and herbs	H-0	II
The common herb is Oxalis	Cal-0	II
Balsam Fir / White Birch		
3. Associated with herbs, mosses not forming a carpet	Co-Ma	I
Balsam Fir / Black Spruce		
4. Associated with herbs and mosses, or mosses alone	H-co	II
Black Spruce		
5. Associated with herbs and ferns	Pte-Ar	I
6. Associated with herbs and mosses, or mosses alone	Hyp Hyp-Co	II II
7. Associated with mosses and dwarf shrubs	Hyp-Ka Ka-Le Cal-Va Cal-Le	III III II III
8. Associated with sphagnum and dwarf shrubs	Sph-Ru Sph-Le	IV IV
Jack Pine		
9. Associated with lichens and dwarf shrubs	Ka-Va Cla-Le Cla-Va	

northeastern coniferous section of the Boreal Forest Region of Quebec. A study begun in 1949 demonstrates the close relationships of soil and subordinate vegetation with the productivity of the forest. It does not deal with systematic integration of the physiographic features of site with the general scheme of site classification, and it is to be accepted that physiography is an integral part of the whole complex problem of forest site classification.

The general scheme developed by the study is summarized in the Table.

Appendices to the published study define the specialized terms used, give scientific and common names of plants, a sample of the form used in field work and summarize the structural and synthetic characteristics of the vegetation in the major subordinate types.

China

• In China, the most important thing is that a coffin timber should be fragrant or scented — and this preference may be one of the influences behind the present dispute about that part of North Burma which immediately adjoins China. For this territory, otherwise of slight account, is one of the two "stations" of the most desired of "coffin trees," *Taiwania cryptomerioides*: the other is the island of Formosa.

The most productive tree, for coffin timbers, is the Japanese cedar (*Cryptomeria japonica*), which, in spite of its name, belongs to China as well as to Japan. Two interesting facts about *Cryptomeria* may be worth noting. The oldest timber building in the world (it is now a Japanese museum, dates from 753, and not long ago celebrated a twelve-hundredth anniversary) is built of *Cryptomeria*. And both the oldest and the longest avenues in the world (about 650 years old and 24 miles long respectively) are of living *Cryptomeria* — both "champions" being in Japan. It is the fragrance of *Cryptomeria* timber that has caused it to be called Japanese cedar: it is nothing like any true cedar in appearance and has no close botanical relationship.

Finland

• In Finland, *Picea abies* forests appear to be spreading rapidly at the expense of *Pinus silvestris* stands. Because both species are valuable for timber, this problem has caused Finnish foresters to ask themselves whether this natural development should be permitted to continue or whether it should be turned in another direction which might be more profitable for the national economy and for the individual owner. A communication of the Forest Research Institute at Helsinki, on the development of managed spruce stands in southern Finland, attempts to give an answer. Comparisons between spruce and pine have been made with regard to such factors as number of trees per hectare, mean diameter, basal area, height, volume, bark percentage, current annual and total volume growth, rotation of maximum volume growth, volume removal, stand structure and total yield.

The conclusion is that, on better quality sites, spruce is more desirable, because of its greater volume growth of stem wood while pine is better for poorer quality sites. However, artificial regeneration of spruce should be practised only where natural reproduction is not practicable because of inadequate numbers or poor quality of seed trees. Proper silvicultural measures can increase greatly, perhaps even double, the growth of spruce forests in southern Finland.

Germany, Federal Republic

• Following recommendations made at the Twelfth Congress of the International Union of Forest Research Organizations in 1956, an agreement has been reached between the forestry faculties of Freiburg, Göttingen and Munich, the Center for Forest Bibliography, Freiburg, the Union of Forest Research Organizations, Hann. Münden, the Federal Research Institute at Reinbek and the Federal Ministry for Food, Agriculture and Forestry to set up a new documentation center for the sciences of forestry and wood utilization at Reinbek. Its task will be the collection and classification of German and foreign titles, clarification of terminology, and the publication of a journal of abstracts. The center will concentrate in the first place on European and Asiatic literature, and it is expected to commence operations soon.

• *Bestockungsaufbau und Baumartenwandel nordischer Urwälder* (STRUCTURE AND TREE SUCCESSION OF NORTHERN VIRGIN FORESTS), by Dr. Richard Plochmann and recently published in Hamburg by Paul Parey, is based on data from 560 sample plots gathered in 1953 during employment with the Forest Inventory of Alberta, Canada. The author considers the problems of

a) occurrence, composition, structure, growth capacity and life cycles of the forest types;
b) influence of forest fires and regeneration of burned areas;
c) succession following fires.

Data is given on the various stages of the spruce-poplar-fir type, and the muskeg and bog forests; on regeneration of burned areas on various sites; and the development of several generations on dry, fresh-moist, and wet sites. Water supply and other site factors are considered to exercise considerable influence on the forest type and rate of successional change.

Ghana

• Light trucks travel over scarcely negotiable roads to collect huge mahogany logs felled in the forests of the newly-independent state of

GHANA: *Building a road into the forest, and felling and clearing trees with wide spreading buttresses, is a long business. Like so many manual tasks in Africa, tree felling is done rhythmically to the accompaniment of musical tempos or improvised songs.*

Photograph: U. K. Information Service

KOREA: *The Institute of Forest Genetics, Suwon, Korea, sent out this photograph as a Christmas and New Year card to its well-wishers. On the experimental grounds of the Institute, visitors can see many acres of pine trees bearing plastic bags over their developing flowers, to make possible the controlled pollination of the most promising individuals. The results are expected to yield progeny of parent trees selected for specific desirable characteristics, such as rapid growth, straightness of stem, resistance to insects, diseases and climatic factors. This extensive breeding work with pines aims at improving the quality of future plantations.*

Ghana, formerly called the Gold Coast. Logs still form the bulk of timber exports but as more sawmills are built, more sawn wood is shipped overseas to the United States and Britain.

India

• Few drugs have attracted so much world-wide attention as the root of *Rauwolfia serpentina*. This is due to its efficacy in reducing high blood pressure and also to its well-marked sedative properties. Several kinds of alkaloid so far discovered from the roots, reserpine in particular, are thought to be responsible for this effect. The plant has a sporadic distribution in India, Ceylon, Burma, Thailand and Java. The present demand for the roots is far greater than the available supply.

Forest Leaflet No. 142 of the Forest Research Institute, Dehra Dun, describes how this small-sized plant can be grown artificially with alkaloid contents similar to the naturally grown plants under Indian conditions. Five pounds (2.3 kg.) of seed, with about 30 to 35 percent germination, are required for planting one acre. For sowing this amount of seed, $^1/_{20}$ acre (0.2 ha.) of nursery is necessary. The seeds are best sown about the middle of May. Beds should be irrigated immediately after sowing, and later as and when required. The germination is gradual, and the growth of the seedlings is slow. Deep sandy loam or sandy clay loam soil appears most suitable for getting good growth of roots. As preparation for transplanting, beds of suitable size preferably with irrigation channels should be laid out according to the lie of the land. Transplanting should be started about the first week of July, when the monsoon rains are established. Tentative spacing is at 2 × 1 feet (60 cm. × 30 cm.). The plants may be irrigated fortnightly in the hot and dry season, and about once a month during winter. About two weedings are necessary during the monsoon, and one hoeing at the end of the growing season. Manuring at the time of hoeing is desirable to get a high yield of roots. From the cultural experiments carried out, it has been observed that, under irrigated conditions, it is possible to obtain roots of exploitable size from about two- or three-year-old plantings. A yield of about 2,000 pounds (907 kg.) of air-dry roots (including fibrous roots) per acre can be obtained from a two-year-old crop and about 3,000 pounds (1,360 kg.) from a three-year-old.

Indonesia

• The Director of the Forest Service reports that as a result of the strong impulse towards industrialization, especially on the overpopulated islands of Java and Madura, special attention has recently been paid to the planning of "industrial" plantations. A special planning committee has been set up to study the possibilities for:

1. supplying present industries with adequate raw materials from the existing forests;
2. establishing new industries to utilize the species commonly available;
3. planting suitable species as raw material supply for already existing industries and new industries in the future.

The committee is primarily concerned with the islands of Java and Madura, because these overpopulated islands are badly in need of industries; the status of the forests is clear and settled (they are nearly 100 percent state forests); and the existing system of roads is adequate for extraction and transportation.

However, 5 percent of the planned industrial forest area is in Sumatra. The first industrial development plan, established with the assistance of an FAO officer, Dr. J. A. von Monroy, has already been approved by the Government and adopted as an integral part of the first national five-year development plan.

Italy

• The new United States Ambassador to Italy has been president of the Crown Zellerbach Corporation, the second largest paper company in the world, since 1938.

Crown Zellerbach, formerly a Pacific Northwest operation, now has plants extending from Miami, Florida, to Ocean Falls, British Columbia. It produces a widely diversified range of more than 400 different forest products — from structural timber to facial tissue. It is a wholly integrated operation — controlling every phase of its operations from tree planting through logging, pulping, paper and other manufacturing, converting, and wholesaling. In accordance with Zellerbach's guiding philosophy of being "merchants of trees," Crown Zellerbach seeks to use each tree it grows to the greatest economic advantage — whether for paper, plywood, lumber or chemical products.

Japan

• An official report to FAO points out that, in prewar days, forest grazing was controlled in connection with the supply of horses for military purposes. Since the war and the cessa-

tion of this demand, control of forest grazing has largely ceased and degradation of soils and grassland has followed.

Now livestock farming is being popularized as a means of rural economic recovery, and the systematic grazing in forest areas of sheep and goats as well as horses and oxen is being practised. Forest grazing is, therefore, coming to play an important part in farming economy, and renewed emphasis is being placed on correct grazing practices and management. Research is being carried out at the Government Forest Experiment Station, and field experiments are being conducted by local authorities and private agencies, to determine the correct management procedures for various types of forest land, how to improve permanent pastures, and the best forage species to grow.

The establishment of shade-trees on the wild land at the foot of Mount Aso is being undertaken, and general economic studies on the utilization of all available grassland.

New Caledonia

• The Forest Service, with such means as it has at its disposal, has been carrying out trials on a modest scale in reforestation with both local and introduced species, as a means of land rehabilitation. A report to FAO says that a few species have proved especially interesting.

Among the indigenous species, those which seem most suitable at low altitudes are *Araucaria cookii*, *Afzelia bijuga*, and the sandalwood *Santalum album*. At medium altitudes, the kauri (*Agathis sp.*) can be used for restocking the forests.

Among introduced species, good results have been obtained with eleven different eucalyptus (*E. naudiniana* in particular) and the mahogany (*Swietenia macrophylla*), which has also been used in Fiji. Other species being tried are *Araucaria cunninghamii*; various pines, in particular *Pinus merkusii* on certain soils, *P. elliottii* which has made promising beginnings, and *P. caribaea*, *P. palustris*, *P. taeda* and *P. radiata* for which it seems possible to find the right ecological conditions. In this range of species, it should be possible to find trees suited to local conditions.

Norway

• The annual " Forestry Calendar " compiled and edited by Julius Nygaard in Oslo, *Skogalmanakk 1957*. has now appeared for the fortieth time, bringing the total number of copies issued up to 120,000. The majority of Norwegian foresters find this pocketbook useful in their work. The new edition is again enlarged and rearranged, and contains more than 500 pages of information on nearly everything of a practical interest to people engaged in forestry and forest utilization.

Sarawak

• A report to the FAO Asia-Pacific Forestry Commission states that large-scale exploitation of timber is still mainly restricted to Mixed Swamp Forests, partly because they are the most accessible and easily worked, partly because they contain the most valuable timber, ' ramin ' (*Gonystylus bancanus*). These forests are almost invariably worked by hand-sledding the logs to a light railway, by means of which they are in turn transported to a floatable river. In one swamp forest of the ' alan ' (*Shorea albida*) type, a sky-line is being used, but the stands of timber in most other types of forest are not large enough to justify such methods. Elephants are used in one Lowland Dipterocarp Forest but have not been a great success.

The number of tree species in Sarawak forests is probably between 2,500 and 3,000, but very few of these can be used at present as timber. Tests of a number of species for use in particle board manufacture are, however, in hand.

The trade in fuelwood is relatively small, with little demand for either firewood or charcoal except in the few large towns, scattered local industries, and a rather erratic export to Hongkong. Both commercial firewood and charcoal are usually mangrove, but there is some demand for the superior and relatively expensive ' ru ronang ' (*Casuarina sumatrana*). Annual commercial production is about 34,000 tons (weight) of firewood and 4,000 tons of charcoal.

The principal minor forest products, the trade in which also depends mainly on export markets, are ' jelutong ' (a wild rubber which is the principal ingredient of chewing gum), ' cutch ', ' damar ', and ' illipe ' nuts (the oil-seeds produced by certain *Dipterocarpaceae*). The export trade in ' jelutong ' is usually valued at about Malayan $3 millions; that of cutch at about $470,000; and of damar at about $45,000.

Good crops of illipe nuts are produced only at irregular and rather long intervals; 1954 was a record year, with a trade valued at $12.6 millions, but since then the crops have been almost negligible.

Surinam

• Writing about the possibilities of afforestation in Surinam with a view to the production of raw material for the paper industry, a correspondent says that the Government of Surinam is making arrangements with certain Netherlands papermills for the plantation and exploitation of forests for the above-mentioned purpose. The attractiveness of the plan is, that the savanna territory — which is of no use as yet for other purposes — might play its part in the devel-

NEW GUINEA, WEST: *A correspondent sent this photograph of fishermen plaiting rattan, an important forest product, into fish traps which are used for sea fishing. A loop of rattan, in the form in which it is sold, appears on the right.*

opment of the prosperity of the country as a whole.

Research favors the introduction of conifers, of which there are some species which develop well in subtropical and tropical areas. It is the intention to try several species before deciding the question which kind of wood will do for the total project.

The idea is to begin with an area of about 3,000 hectares for an experimental period of 5 to 10 years, and then extend planting to 40,000 hectares. The pulpwood will be shipped in the round from Surinam to the Netherlands.

Switzerland

• In a recent issue of *Unasylva*, reference was made to the fact that the Federal Assembly of the Swiss Confederation had passed an important new law that makes substantial amendments and additions to the laws of 11 October 1902 and 19 December 1951, which are the basic forest laws of Switzerland.

The main provisions of the new law, which is a striking advance in forestry legislation, are:

1. By means of subsidies, it enables the Confederation to encourage the training of forest workers arranged by the Cantons or forestry organizations.
2. The law lays down further cases in which the Confederation may subsidize forestry work, or increase the rate of the subsidies that could hitherto be granted. Thus subsidies may be given for the establishment of new protective forests, reclamation work in this connection, and the construction of engineering works to protect such forests against avalanches and falls of rock; reforestation to be carried out in protective forests as a result of extraordinary circumstances, such as serious fires or attacks by pests; the establishment of access roads; towards the expenditure entailed by the re-grouping of plots of private forests; construction of roads, paths and cableways in areas liable to avalanches (up to 80 percent of cost), construction of avalanche control works (up to 80 percent); and fencing and other arrangements for the protection of plantations against grazing by livestock (also up to 80 percent).
3. It empowers the Confederation to promulgate the necessary regulations for control and protection against forest pests and diseases, including the treatment of threatened stands and the control of imports of seed, planting stock and forest products from abroad. It is compulsory to use " seed and planting stock of known provenance and suited to the site " for carrying out afforestation and reforestation projects.
4. Finally, it increases the scale of the fines for certain offences against the law. For infringements of the regulations relating to forest protection and the provenance of plants and seed, the fine is fixed at from 20 to 2,000 Swiss francs.

A Federal Council Decree of 16 October 1956 relates to the enforcement of two compulsory measures laid down in the new law. It enjoins on the cantons the obligation to establish forest plant protection services functioning under the supervision of the Federal Department for Forest Inspection, which is also authorized to set up an advisory forest plant protection commission. The cantonal forest plant protection services must prescribe control measures and verify their application, as well as that of any measures that may be prescribed by the Federal authorities.

The use of suitable seed and planting stock in planting projects is the joint responsibility of the landowner and of the proprietors of seed firms, private or public forest nurseries, and dealers and importers who supply planting material and seed.

United Kingdom

• *Forestry Abstracts* has recently included a compact summarization of the use of aircraft in forest insect control, based on analysis of 174 publications, mostly those of the Commonwealth. Part I deals with history, aerial surveys and the application of insecticides by dusting and spraying. Part II covers recent spruce-budworm operations, both in Canada and the U.S.A. (Canada, in particular, has pioneered and developed air techniques). Part III covers assessment of results, and is particularly complete in reporting the effects of treatment on the pest and associated insect populations, the effects on the forest, and the effects on vertebrates. Since there is controversy, particularly on the latter, it is well to have brought together so thorough an analysis of the technical literature.

In the final section dealing with conclusions and future developments, an analysis is given of experience to date. It stresses the pre-control studies that should be made, the necessity for realistic cost estimates, the limitations in spraying which is not a cure-all or complete substitute for other methods, and the limitations of aircraft in spotting incipient outbreaks. Air survey does not displace ground methods. This compilation is of great value to countries which are embarking or contemplating undertaking forest insect control operations.

• The forest policy of the United Kingdom aims at establishing, largely by means of new plantations, a woodland area of 5 million acres (2 million ha.), capable of supplying in normal times one third of the country's needs while forming a reserve available for emergencies.

An important problem arises in regard to the organization of the home market for the timber which is now being offered from plantations to consumers in increasing quantities. There must be a market for the timber, especially small-sized timber, derived from the thinning of plantations, the successful disposing of which is not always easy. But the home market is dominated and will continue to be dominated by the import trade from abroad. However, the Forestry Commission can also exercise a marked influence and must do so. Otherwise the private owners, on whom the implementation of the planting program partly depends, will be faced with problems which, if unsolved, would seriously discourage them, despite the efforts of the Forestry Commission to promote their co-operation, and favorable legislation.

In May 1954, the Minister of Agriculture and Fisheries and the Secretary of State for Scotland appointed a Committee on the Marketing of Woodland Produce which, in May 1956, submitted to the Forestry Commission a well-considered report that has recently been published.

The Committee reached the conclusion that " in spite of the competition of alternative materials, the total demand for timber and its products is far in excess of home production, both present and potential ". The solution of the problem finding outlets for home-grown timber must therefore be sought essentially in the organization of the owners and the market.

The Committee suggests:

1. The organization of an effective association of private forest owners. The association would be voluntary, but would seek to group all owners, large and small. It could have national sections for England, Scotland and Wales. Local branches would represent in their respective areas the interests of private owners against all other interests. The association would cover the whole field of forestry, from marketing and the sale of products to technical assistance to its members, including the supply of labor and equipment. (There are already some co-operative forestry associations in the United Kingdom, but their objectives and the limited number of their members prevent them from having any effective influence on the home market, despite the great services they certainly otherwise render.)
2. The establishment of a central advisory body comprising not only representatives of the Forestry Commission, of private owners and the timber trade, but also representatives of consumer interests and some independent members. This body would deal with all matters relating to the marketing of home-grown timber. While remaining an advisory body, its authority "should be recognized to be such that in the event of a conflict with the Forestry Commission, the situation would have to be resolved by Ministers". The existing Home-Grown Timber Advisory Committee could serve as the nucleus of this new body, if its responsibilities were extended and its constitution enlarged in the desirable direction.

United States of America

• The Conservation Reserve Program recently put into effect in the United States is only part of a vast agricultural and land use policy covered by the general name of the Soil Bank Program. It is defined as follows:

"The Conservation Reserve Program is a long-term program designed to carry out the policy of the act (i.e. the Soil Bank Act) by assisting farmers to divert a portion of their cropland from the production of excessive supplies of agricultural commodities, and to carry out soil, water, forest and wildlife conservation practices. In carrying out this program the Secretary (of Agriculture of the U.S.A.) will enter into contracts with producers (a) to share the costs of establishing approved conservation practices on the conservation reserve and (b) to make annual payments to such producers for maintaining the conservation uses for the term of the contract."

The lands to which the Act applies comprise all those that are used for crops, or are regularly mown or bear fodder crops and do not require annual ploughing. Their area must not be under 5 acres (2 ha.) per farm or 2 acres (0.80 ha.) if they are intended for afforestation, but this limit may be reduced to 1 acre (0.40 ha.) in particular cases.

The goal set is to reserve for 1957, 20 million acres (8,000,000 ha.), of which 54 percent would be provided by the States of Colorado, Illinois, Iowa, Kansas, Minnesota, Missouri, Nebraska, South and North Dakota, Texas and Wisconsin.

The Act is administered by county committees and State committees, of which representatives of the State Forest Services form part.

The duration of the contracts is for 3 or 5 years, if the county committee considers that the reserved land has already a sufficiently protective vegetative cover; for 5 and possibly 10 years, if it considers that a protective vegetative cover other than trees or shrubs should be established, or if the land is used for establishing a reservoir or carrying out soil, water or wildlife conservation practices; for 10 and possibly 15 years, if afforestation is to take place.

By this contract, the farmer or the owner of the farm undertakes

"to establish and maintain... in accordance with good farming practice... for the contract period ... an approved protective vegetative cover or other approved conservation practices on the conservation reserve".

The protective vegetative cover may only be approved if it consists either of trees or shrubs or, at least in regard to the greater part, of perennial grasses and legumes suited to the site.

The Soil Conservation Service is responsible for determining, supervizing and certifying the practices carried out in fulfilment of the contract. The Forest Service, however, is responsible in regard to the establishment of trees or shrubs.

The lands covered by the contract must not produce any crop (except timber in accordance with good forestry practices) during the period of the contract. Reservoirs may not be used for irrigation outside such lands. The lands must not be grazed, save in exceptional cases.

On the other hand, each county committee determines for each farm the average area (called 'soil bank base') that, during the two years previous to the start of the contract, has been devoted to agricultural crops other than grasses or legumes grazed or used for forage or certain peas and other pulses. If this area is over 30 acres (12 ha.), the farmer must undertake for the duration of the contract not to devote to the production of the corresponding crops a larger area than the 'soil bank base', less the area put into reserve. If it is under 30 acres, he undertakes not to cultivate, for the same period, more than the 'soil bank base'.

In principle, the Federal Government contributes 80 percent of the expenses agreed upon for carrying out the conservation practices. This contribution, however, is subject to a number of limitations. For the construction of reservoirs by private persons, for instance, it may not exceed $500. Not all the expenses coming under the cost of the work entail such a contribution. The payment of the Federal contribution may be spread out as the work is carried out. The Federal contribution in money may be replaced, in part at least, by the provision of services, material or equipment from the Federal Government or State.

The farmer who has signed a contract and fulfilled its conditions, is entitled to the payment of an annual sum. This varies according to the quality and value of the land of each farm, but it is so calculated that, for each State, the average sum paid per acre corresponds to a definitely fixed figure, varying, according to the State, between $8 and $13 (the latter figure being reached only in the States of New Jersey and Connecticut). But the farmer loses the right to any payment and his contract is deemed broken, if he cultivates, for a given year, a greater area than his 'soil bank base'. Except in very special cases, the sum payable annually to each farmer is limited to $5,000.

Provisions are made for an equitable distribution, if necessary, of the sums paid by the Federal Government between owners, farmers and tenants, and in order to prevent collusion of interests.

Breaches of contract are liable to the penalty of having to pay back to the Federal Government the whole or part of the sums paid by the latter, plus interest at 6 percent.

Book Notices

A World Geography of Forest Resources. The American Geographical Society - Editors S. Haden-Guest, J. K. Wright, E. M. Teclaff, with 35 contributors. 736 pp. The Ronald Press Co. New York. 1956. $12.50.

This impressive volume helps to fill a long-felt need. It will for a long time constitute a necessary work of reference " providing essential information for professional workers and students in the fields of forestry, geography, conservation, and ecology ". The style used, at least in the general chapters, will have special appeal to the " layman who feels concern for the present and future of the world's natural resources ". Certainly the list of contributors, including as it does the names of leaders in conservation thought and in forest administration and research, will impress all readers.

The first five general chapters deal with the importance, the history, the influence of forests, the principles and practices of forestry, and the forest products industries of the world. These, with the final chapter on the outlook for the world's forests and their chief products, provide a stimulating summary of the basic elements necessary to an understanding of forest geography.

The remaining 25 chapters deal with the forest resources of the major regions of the world and the major forest countries, bringing up to date, in most cases, much of the data of Zon and Sparhawk's two-volume *Forest Resources of the World*, which has been a basic reference since its publication in 1923. Many of the contributors of regional and country material have documented their statistical data by citations from publications of FAO, including *Unasylva*, *World Forest Resources*, the *Yearbooks of Forest Products Statistics*, *World Pulp and Paper Resources and Prospects*, and *European Timber Trends and Prospects*.

Critical readers may regret a certain lack of balance in the space given to various regions and countries. For instance, Ceylon gets 9 pages and Korea 12 pages, against 28 pages for the U.S.S.R. and 30 pages for the whole of South America. Nevertheless, even these critical readers will be more than favorably impressed by the outstanding chapters on Canada, the United States, Northern Europe, tropical Africa, the Philippines, Japan, Australia and New Zealand.

The American Geographical Society, the editors, and the authors are to be congratulated on this milestone toward greater general appreciation of the world's forestry problems. It is encouraging to see the presentation of the progress being made by foresters all over the world in meeting their responsibilities and obligations, and in making the forests under their charge contribute to an ever-increasing extent towards the needs of the people of the world.

Dendroclimatic Changes in Semiarid America. Edmund Schulman. pp. 142. University of Arizona Press. Tucson 1956. $3.00.

The research described in this interesting publication sought to discover and develop the longest possible chronologies of year-by-year rainfall and river flow variations as revealed by the annual growth-rings of the oldest suitable trees. The scientific basis of this was established by A. E. Douglas of the Carnegie Institution of Washington in 1919 and 1928.

Over 300,000 annual rings in selected, drought-sensitive trees from semi-arid sites were analyzed to provide a basis for regional indices of fluctuations in rainfall in the upper basins of all the major streams of western United States. In most areas these indices threw light on water run-off also. Comparisons of growth fluctuations in recent decades with those of past centuries helped to identify drought periods and variations in climate.

Among the trees studied were *Pinus flexilis*, 2,000 years; *Pinus aristata*, 4,100 years; *Pinus edulis*, 980 years; *Pinus ponderosa*, 860 years; *Pseudotsuga menziesii*, 890 years.

Appended to the study are details of the results obtained for some 13 river basins in western North America, and in the Patagonian Andes. A most interesting description is given of a study of *Pinus aristata* trees in the 4,000-year age-class (older than the 3,200 + years of *Sequoia gigantea*, heretofore recognized as the oldest dated tree).

FAO MEETINGS

Because of unforeseen circumstances, the sessions of the *Near East Forestry Commission* and the *Latin-American Forestry Commission*, due to have been held in 1957, have had to be deferred until 1958.

The fourth session of the *Asia-Pacific Forestry Commission* is now scheduled to take place at Bandung, Indonesia, from 8–21 June 1957, preceded by a meeting of the *Teak Subcommission*, and the ninth session of the *European Forestry Commission* from 7-18 May at Rome.

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TIPOGRAFICA CASTALDI - ROMA - 1957

FORESTRY AND FOREST PRODUCTS STUDIES

	U.S.$	£
Planning a National Forest Inventory 1950, 88 pp. (EFS) New edition in preparation.	1.00	5s.
Forest Policy, Law and Administration 1950, 212 pp. (EFS)	2.00	10s.
Grazing and Forest Economy 1953, 162 pp., illus. (EFS)	2.00	10s.
Elements of Forest Fire Control 1953, 110 pp., plates (EFS)	1.00	5s.
Raw Materials for More Paper: Pulping Processes and Procedures Recommended for Testing 1953, 172 pp., tables (E)	2.00	10s.
Forestry Abstracts Coverage List 1953, 180 pp. (Trilingual)	1.50	7s.6d.
National Forest Policies in Europe 1953, 370 pp., tables (EF)	3.00	15s.
Research in Forestry and Forest Products 1953, 324 pp., tables (E)	3.00	15s.
Directory of Forestry Schools 1953, 298 pp. (E)	3.00	15s.
Eucalypts for Planting 1955, 404 pp., illustrations, bibliography (EFS)	3.50	17s.6d.
Les Peupliers dans la production du bois et l'utilisation des terres 1956, 526 pp. illus. (FS. E in prep.)	3.50	17s.6d.

FORESTRY DEVELOPMENT PAPERS

Tractors for Logging 1954, 196 pp., illus. (EF)	2.00	10s.
World Festival of Trees 1954, 74 pp. (EFS)	0.75	3s.9d.
Forest Plantation Protection against Diseases and Insect Pests 1954, 42 pp. (EFS)	0.50	2s.6d.
Handling Forest Tree Seed 1955, 110 pp. (ES)	1.00	5s.
Tree Seed Notes I. Arid Areas II. Humid Tropics 1955, 354 pp. (ES)	3.50	17s.6d.
Tree Planting Practices for Arid Areas 1955, 126 pp., illus. (EFS)	1.50	7s.6d.
Tree Planting Practices in Tropical Africa 1956, 302 pp., illus. (EFS in prep.)		
L'agriculture nomade. Vol. I: Congo belge; Côte-d'Ivoire. 1956, 230 pp., illus. (F)	2.00	10s.
Tree Planting Practices in Temperate Asia: Japan 1956, 156 pp. illus., (E)	1.50	7s. 6d.
Tree Planting Practices in Tropical Asia 1957 (EFS in prep.)		

FOREST ECONOMICS PUBLICATIONS

	U.S.$	£
Yearbook of Forest Products Statistics Annually, 1947-1956 (Trilingual)	2.50	12s.6d.
World Forest Resources 1955, 120 pp. (Trilingual)	2.50	12s.6d.
Timber Bulletin for Europe	Sw.fr.	
Single copy	4.00	1.00 7s.6d.
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